88th YEAR

AMERICAN GAS JOURNAL

OCTOBER 1945

Dec 24

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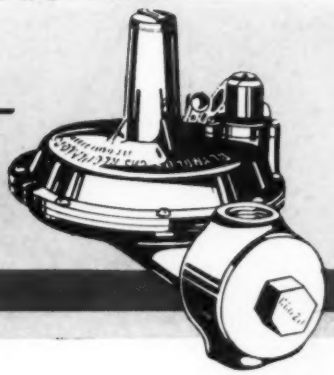
from origin to user—

it's **REYNOLDS GAS CONTROLS**



Reynolds builds a Regulator for every type of Gas Control installation. Proven by records of performance in actual operation, or by records of factory tests on new developments, every Reynolds unit—whether for high pressure or low—is a proven product.

For more than half a century, Reynolds has concentrated exclusively on Gas Control devices. Leaders in the Gas Industry use Reynolds Regulators with full confidence, and with good reason—for accurate Gas Control, by Reynolds, from one ton down to inches W. C., has been an accomplished result for many years.

GAS CONTROL *Since* 1892

REYNOLDS BUILDS A COMPLETE LINE OF GAS CONTROLS

High Pressure Service House Regulators: Straight Lever Type—Models 10-20 Series. Toggle Lever Type—Model 30 Series.

Low Pressure Service or Appliance Regulators.

District Station Regulators, Auxiliary Bowl and Automatic Loading Device Optional.

High Pressure Line Regulators Pilot Loaded—Pilot Controlled.

Toggle Type Regulators, Single Valve, Double Valve.

Seals: Dead Weight or Mercury Relief Valves; High or Low Pressure.

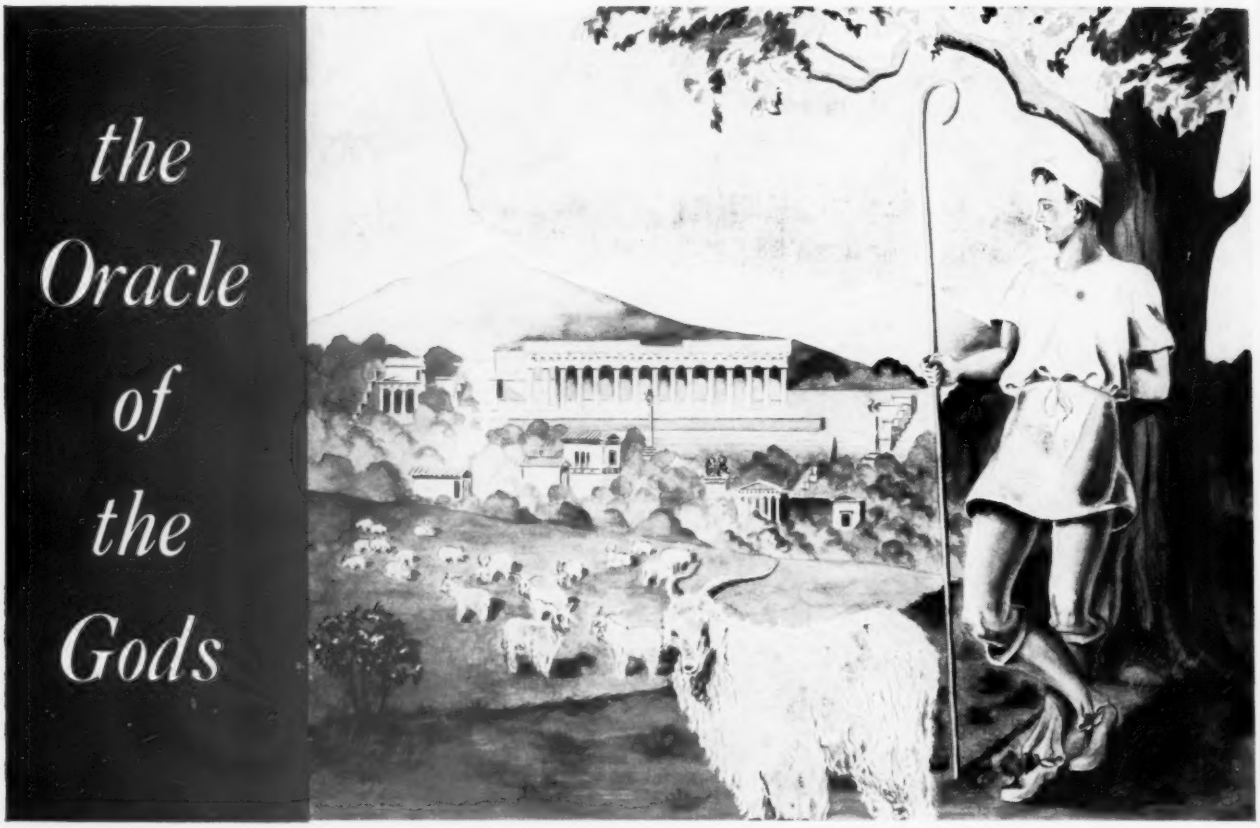
Back Pressure Valves, Automatic Quick-Closing Anti-Vacuum Valves.

Automatic Shut-off Valves, Lever Operated Valves, Louver Operated Device, Atmospheric Regulators, Vacuum Regulators.

REYNOLDS GAS REGULATOR CO. ANDERSON, INDIANA U. S. A.

RECOGNIZED GAS CONTROL SINCE 1892

OCT 26 1945



First spokesman for a great industry

Legend credits a boy goat-tender with the discovery of natural gas in ancient Greece. This lad noticed the peculiar behavior of his animals whenever they came near a certain spot. Investigating villagers became giddy and affected by something that arose from the ground.

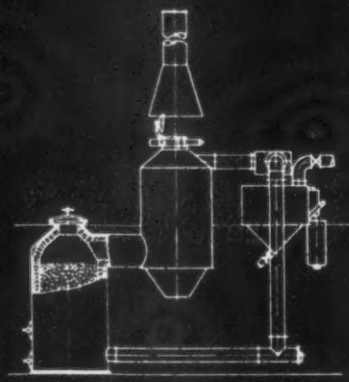
In those days, the Greeks considered the weak-minded as special favorites of their gods. They treated such unfortunates reverently. The seeping gas made the villagers light-headed and talkative. They concluded that a god must live at this place. They built a temple and appointed a priestess to converse with this god. Thus "gas became the Oracle of the Gods" and the Temple of Delphi famous.

Today, gas as a fuel speaks for itself—in convenience, cleanliness, and economy. Working in close cooperation with gas distribution engineers, EMCO Meter and Regulator developments have for many years helped further the advance of this industry.

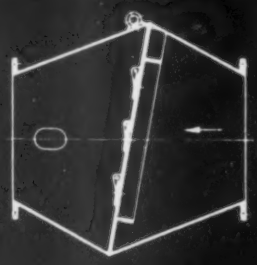
Pittsburgh Equitable Meter Company
. . . . . Pittsburgh 8, Pa.

Partners for progress
GAS THE CLEAN, CONVENIENT, ECONOMICAL FUEL
EMCO EQUIPMENT FOR GAS MEASUREMENT AND CONTROL

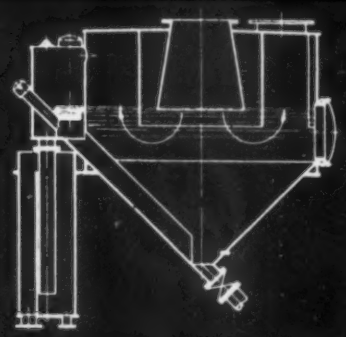
BEST
GAS DOES IT ~~BETTER~~



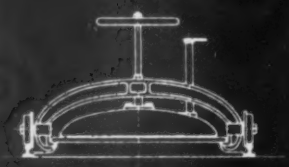
BLUE GAS MACHINE



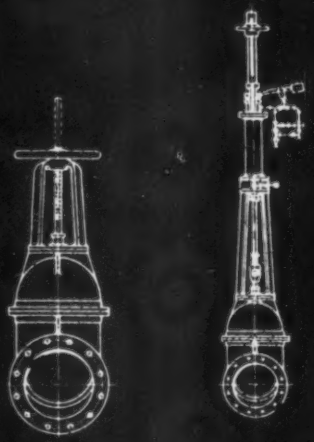
CHECK VALVE



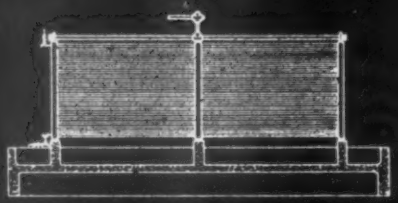
HYDRAULIC SEAL
OR
WASH BOX



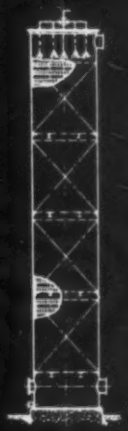
CHARGING DOOR



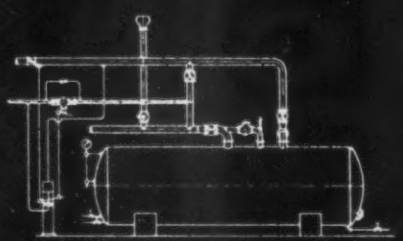
HAND OPER. HYDR. OPER.
GATE VALVES



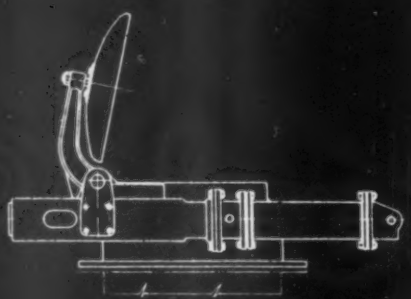
COOLING COIL



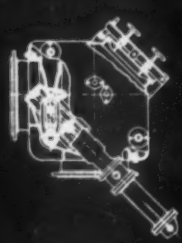
GAS SCRUBBER



STEAM ACCUMULATOR

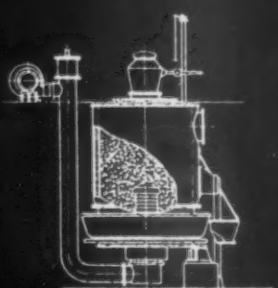


HYDRAULIC OPER.
STACK VALVE

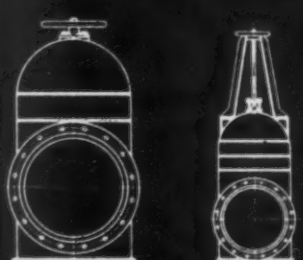


HYDRAULIC OPER.
REVERSING VALVE

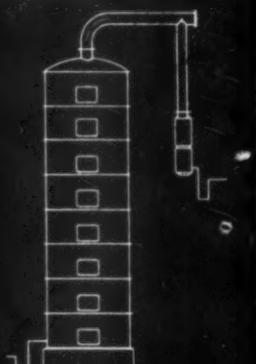
WASTE HEAT BOILER



GAS PRODUCER



BLAST GATES



DISTILLATION
EQUIPMENT

SEMET-SOLVAY ENGINEERING CORP.
40 RECTOR STREET
NEW YORK 6, N.Y.

All-Year Gas Air Conditioning

AMERICAN GAS JOURNAL, October, 1945. Vol. 163, No. 4. Published monthly by American Gas Journal, Inc., at 34 North Crystal St., East Stroudsburg, Pa. Executive and Editorial offices at 53 Park Place, New York 7, N. Y. Entered as second-class matter, October 7, 1928, at the post office at East Stroudsburg, Pa., under the Act of March 3, 1879. Printed in U. S. A.

. . . A New Way to Dramatize "GAS—THE MODERN FUEL"

Only the Servel unit provides all 6 functions needed to bring "New Quality of Living" to tomorrow's homes

Now the Gas Companies have another big opportunity to sell the modernity of gas and gas service. The Servel *All-Year* Gas Air Conditioner is entirely new and different. It represents a completely new concept in living comfort . . . a concept which marks it as the most modern, up-to-date equipment of its kind.

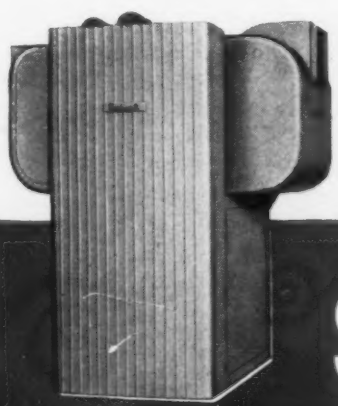
For the Servel unit—and the Servel unit alone!—provides all six vital functions of all-year air conditioning *in one unit.* It cools and dehumidifies in summer, heats and humidifies in winter, filters the air and circulates it at room temperature between seasons. All six functions are regulated by one simple central control, the "Selectrol."

In short, tomorrow's homeowner can enjoy an entirely "New Quality of Living," thanks to the Servel *All-Year* Gas Air Conditioner. With the flip of a finger, he can select just the climate he wants indoors the year round, no matter what the weather outside!

This is no vague, post-war possibility. It's proven fact! The Servel unit was ready for commercial production—after ten years of laboratory and field testing—when the war diverted materials and machinery to other purposes. In more than 400 test installations throughout the United States—some operating more than four years—the Servel unit has received universal acclaim for its efficiency, economy, and dependability.

Distribution of this revolutionary new equipment for new and old homes and commercial establishments will be through the Gas Companies. By properly displaying and promoting it in the years to come, they have an exceptional opportunity to increase their customers' acceptance and appreciation of gas as the modern fuel.

Indication of the demand that may be expected for the Servel *All-Year* Gas Air Conditioner is afforded by impartial surveys made during the war. 54% of a group of prospective homebuilders contacted by the National Association of Homebuilders said they would not build or buy unless they could get *complete* year-round air conditioning. McCall's Magazine found that 29% of its readers listed all year air-conditioning as a "must" for their post-war homes.



SERVEL, Inc. EVANSVILLE 20, INDIANA

PROVEN COALS whose performance during many years merits full consideration in order to provide excellent economy in the post war period.

RODA · DENDRON · STONEGA · PREMIX · CRITERION COAL · CROZER · Admiralty Coal

These coals have in part maintained enviable reputations in By-product Coke Plants, Coal Gas Retort Plants, Gas Producer Plants and Steam Generating Plants.

The following table shows certain properties of these coals as filed with the Statistical Bureaus of the Bituminous Coal Division.

			ANALYSES ON DRY BASIS AND MOISTURE AS SHIPPED						
Trade Name	Coal Seam	Size	H_2O %	V.M. %	F.C. %	Ash %	S. %	B.T.U.	A.S.T. °F.
Roda	Taggart	R.O.M.	2.00	36.00	61.00	3.00	.54	15025	2200
Roda	Taggart	¾x0	2.50	35.90	61.10	3.00	.49	14975	2175
Dendron	Marker	R.O.M.	2.00	36.60	60.80	2.60	.65	15000	2400
Dendron	Marker	¾x0	3.00	36.00	60.62	3.38	.65	14900	2390
Stonega	Imboden	R.O.M.	3.00	35.00	58.50	6.50	.77	14100	2600
Stonega	Imboden	1¼x0	3.00	35.00	58.50	6.50	.77	14100	2600
Premix	Marker &	2x0	3.00	34.80	59.45	5.75	.85	14433	2675
Premix	Imboden	1½x0	3.00	34.85	59.45	5.75	.85	14433	2675
Westmoreland-Criterion (Part Washed)	Pittsburgh	R.O.M.	3.00	34.50	58.50	7.00	.80	14200	2600
	Pittsburgh	1¼x0	4.00	33.80	58.60	7.60	.90	14100	2550
Crozer	Poca., #3	R.O.M.	2.75	17.60	76.30	6.10	.63	14800	2290
Crozer	Poca., #3	1¼x0	3.95	17.85	76.15	6.00	.66	14850	2295
Admiralty	Beckley	R.O.M.	2.25	18.52	75.76	5.72	.91	14781	2830
Admiralty	Beckley	1¼x0	2.35	18.73	75.64	5.63	.83	14810	2870
Admiralty	Sewell	R.O.M.	3.00	19.16	77.04	3.80	.91	15148	2450
Admiralty	Sewell	1¼x0	2.96	19.37	76.33	4.30	.89	15052	2520

Roda, Dendron, Stonega & Premix Coals are produced by Stonega Coal & Coke Co., Big Stone Gap, Va. All mines are on the Interstate Railroad with the exception of Imboden Mine which is on the Southern Railway. The Interstate Railroad connects with the Southern and the L. & N. at Appalachia, Va., with the N. & W. at Norton, Va., and with the C. C. & O. at Millar Yard, Va.

	Roda Mine	Derby Mine	Dunbar Mine	Stonega Mine	Imboden Mine
Roda Coal	Index #415	Index #160	Index #671		
Dendron Coal	Index #672	Index #517	Index #179		
Stonega Coal				Index #451	Index #250
Premix Coal	Index #3960	Index #519			

Westmoreland Criterion Coal is produced by Westmoreland Coal Co., Irwin, Pa., at its Hutchinson and Magee Mines, Indices No. 95 and No. 135, respectively; both on the Pennsylvania R. R.

Crozer Coal is produced by Crozer Coal & Coke Co., Elkhorn, McDowell Co., W. Va. at its Crozer Mine, Index No. 49, located on N. & W. Railway. Also by Page Coal & Coke Co., Pageton, McDowell Co., W. Va. at its Page Mine, Index No. 136, located on N. & W. Railway.

Admiralty Coal is produced by Crab Orchard Imp. Co., Eccles, Raleigh Co., W. Va. The Beckley seam coal is produced at Eccles 5 Mine, Index No. 62 and the Sewell seam coal is produced at Eccles 6 Mine, Index No. 63. Both of these mines are on the C. & O. and the Virginian Railway.

Glenbrook Mine in Harlan Co., Ky., on the L. & N. will begin producing Taggart and High-splint seam coals in April, 1946. The latter will be particularly suitable to the Water Gas process.

GENERAL COAL COMPANY

123 SOUTH BROAD STREET PHILADELPHIA 9, PA.

BRANCHES: BLUEFIELD, W. VA., BOSTON, BUFFALO, CHARLOTTE, N. C., CINCINNATI, DETROIT, NEW YORK, NORFOLK, PITTSBURGH

Competent technical service always available without obligation.

Performance . . .

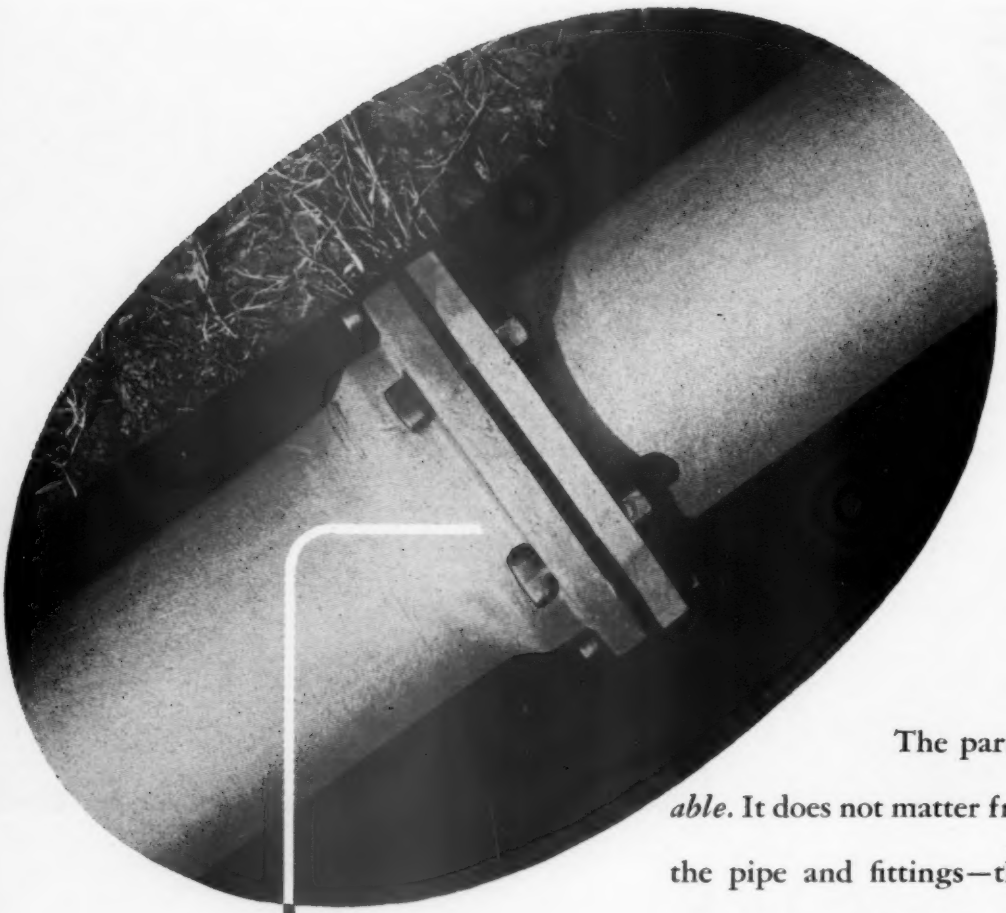
Regardless of any other consideration, the important thing about a gas-purifying material is the RESULT it produces. Appraised on the basis of PERFORMANCE, a *low-priced* purifying material that is slow-acting or has limited capacity for absorbing sulphur is an *expensive* material to use.

Over a long period of years, in hundreds of gas plants, LAVINO ACTIVATED OXIDES have consistently and continuously proved that they can be relied upon to give uniformly satisfactory and profitable results with loads of all sizes, from traces to the heaviest.

LAVINO "ACTIVATED" OXIDE

E. J. LAVINO AND COMPANY

1528 WALNUT STREET, PHILADELPHIA 2, PA.



NOW

The parts are *interchangeable.* It does not matter from whom you buy the pipe and fittings—the glands, gaskets and bolts will be *interchangeable.* No longer any need to stock different parts—no longer

THIS BOTTLE-TIGHT JOINT IS *Standardized*

any risk of delay on the job through delivery of wrong parts. The mechanical joint is now *standardized.*

An eminent gas distribution engineer has said that there are three great chapters in the contribution of cast iron pipe founders to the gas industry. *First,* cast iron pipe itself, which made gas distribution in America possible; *second,* the development of the bottle-tight mechanical joint; *third,* the standardization of the mechanical joint.

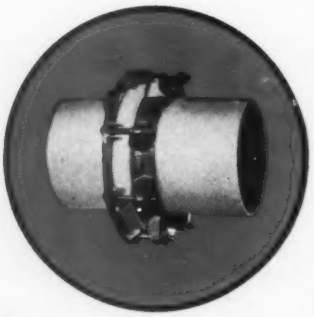
All members of Cast Iron Pipe Research Association are now manufacturing the Standardized Mechanical Joint, with interchangeable parts, in sizes up to 12 inches. Larger sizes will be announced later. Cast Iron Pipe Research Assn., Thomas F. Wolfe, Research Engineer, Peoples Gas Bldg., Chicago 3, Illinois.

CAST IRON

***Standardized* MECHANICAL JOINT**

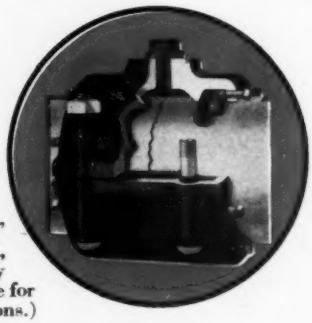
PIPE

3 With gland in position, insert bolts and tighten partially with fingers.
4 Take ordinary ratchet wrench (only tool needed), tighten up bolts alternately (bottom bolt, then top bolt, and so on). That's all!

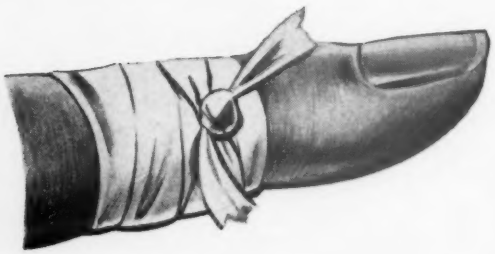


Style 60—for repairing bell and spigot joints: 3″ to 60″ sizes.

Don't forget to order

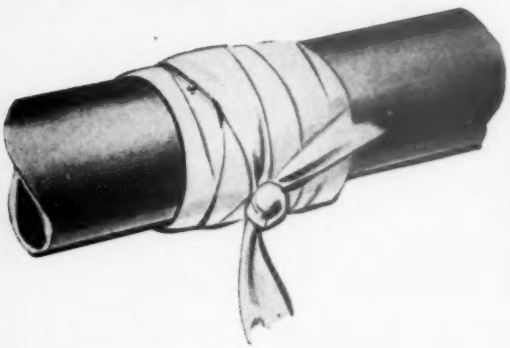


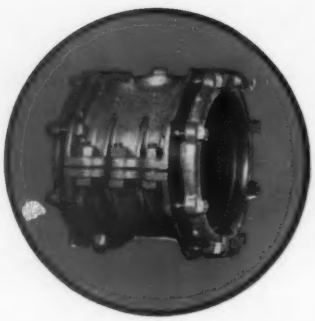
Style 80—"Ready-Pack" repair sleeve, for sizes 3″, 4″, 6″, 8″, CIP. Highly adjustable. (Also suitable for making service connections.)



for Repairs

Style 96—to permanently repair defective joints, splits or holes in steel pipe, 12″ to 24″ OD.





Styles 57 and 73—the former for repairing breaks in straight run of cast iron pipe, 2″ to 12″ sizes; and the latter for steel pipe sizes 2″ to 12″.

We needn't remind you what severe operating conditions can do to your gas lines . . . but we should remind you to place orders for Dresser repair clamps and split repair sleeves as early as possible.

The items shown above represent the leaders in the line of Dresser repair products. No matter what type of leak or break occurs in your lines, Dresser has or can make the proper type clamp or sleeve . . . another example of Dresser service to the gas industry.

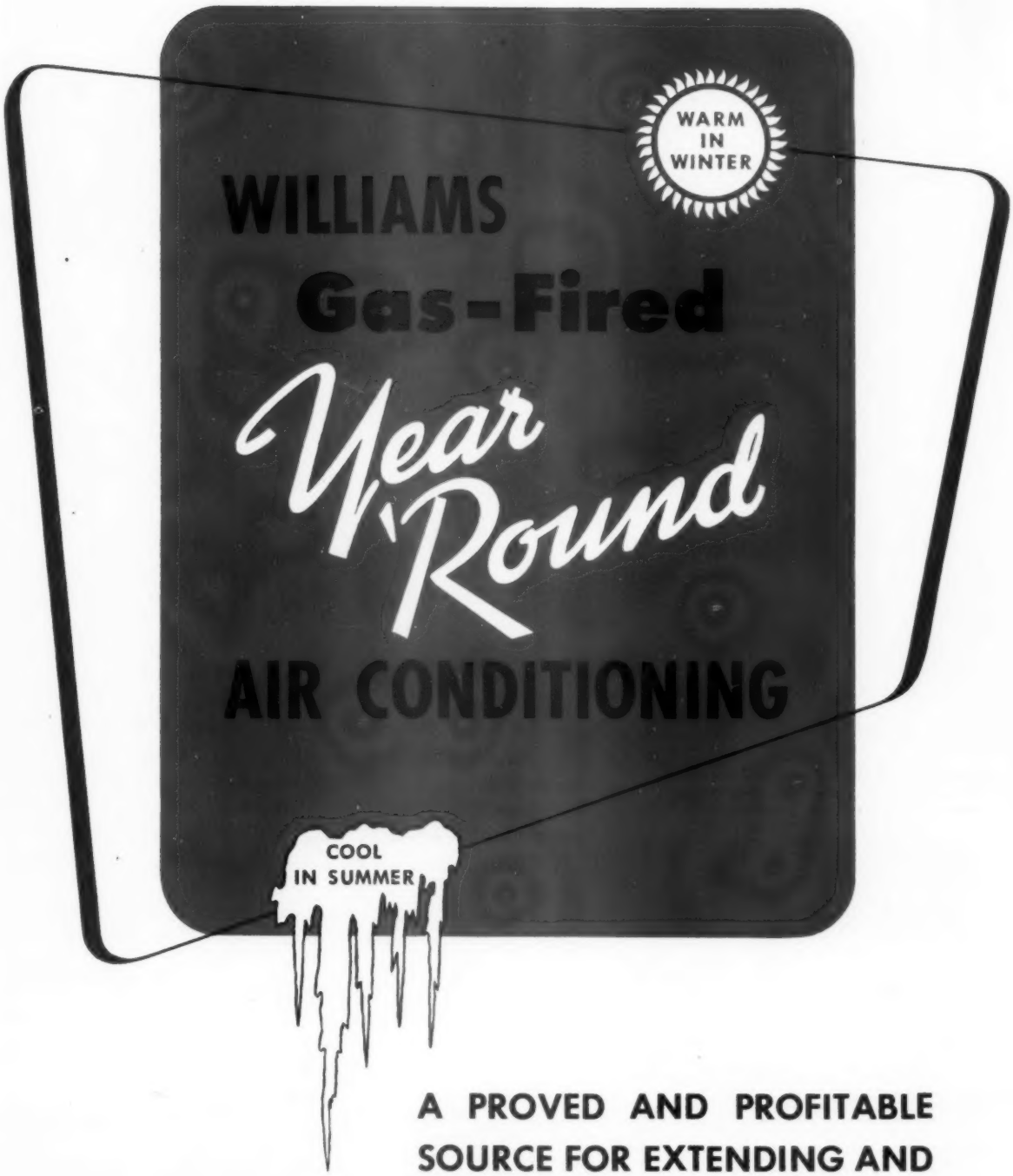
We will soon be able to again make prompt shipments from complete stocks. Until that time comes, let us know your requirements as far ahead as possible. Your orders will be entered on our production schedules immediately.

★ ★ ★

DRESSER MANUFACTURING DIVISION
Bradford, Pennsylvania
One of the Dresser Industries
In Texas: 1121 Rothwell St., Sec. 16, Houston, Texas.
In Canada: Dresser Manufacturing Co., Ltd., 60 Front Street, West, Toronto, Ontario.

DRESSER **REPAIR CLAMPS and SLEEVES**

ONE OF THE DRESSER INDUSTRIES



A PROVED AND PROFITABLE SOURCE FOR EXTENDING AND LEVELING GAS LOADS

HEATING
AIR-O-MATIC
COOLING

IN USE FROM COAST TO COAST . . . AIR-O-MATIC

● Strand Theater, Laurel, Mississippi. Equipped with Williams AIR-O-MATIC Gas-Fired Air Conditioning since 1939.

● Howard Tilton Library, Tulane University of Louisiana, New Orleans, Louisiana. Equipped with Williams AIR-O-MATIC since 1940.

● Shudde Bros. Main Street store, Houston, Texas. Equipped with Williams AIR-O-MATIC Gas-Fired Air Conditioning since 1939.

WILLIAMS *Gas-Fired* THE YEAR 'ROUND AIR CONDITIONING

Pictured on these two pages are just a few of the many users of Williams AIR-O-MATIC gas-fired air conditioning units . . . proof of the nation-wide acceptance already accorded Williams.

Postwar commercial and industrial demands for year 'round air conditioning will be enormous. Manufacturing plants, office buildings, hotels, restaurants, theaters, and other public and private buildings are already "hot" prospects.

Williams AIR-O-MATIC gas-fired absorption equipment puts public utilities in a preferred position to fill these needs . . . and by so doing opens up for them a new and profitable means of extending and leveling gas loads.

● First Church of Christ Scientist, Houston, Texas. Year 'round air conditioned with Williams AIR-O-MATIC since 1939.

● The Boone Clinic, Laurel, Mississippi. Equipped with Williams AIR-O-MATIC Gas-Fired Air Conditioning since 1939.

● Washington Gas Light Company, Washington, D. C. All public spaces air conditioned by Williams Gas-Fired AIR-O-MATIC since 1942.

● Monrovia office, Southern Counties Gas Company of California. Air conditioned with Williams Gas-Fired AIR-O-MATIC since 1937.

● Oak Park, Illinois store of Public Service Company of Northern Illinois. Equipped with Williams AIR-O-MATIC since 1940.

● Central Savings Bank & Trust Company, Monroe, Louisiana. Equipped with Williams Gas-Fired AIR-O-MATIC Air Conditioning since 1939.

HEATING
AIR-O-MATIC
COOLING

10 IMPORTANT ADVANTAGES

of Williams AIR-O-MATIC Gas-Fired Low Pressure Steam Absorption Units for Year 'Round Air Conditioning

1. ECONOMY

In many areas, utility rates are such that the gas-fired Air-O-Matic affords substantial savings for year 'round air conditioning and presents a further economy by extending the usage of winter heating equipment and fuel through the summer season.

2. LOW POWER INPUT

Since low pressure steam is the source of energy for the refrigeration, the total connected horsepower requirements for an Air-O-Matic installation are approximately 1 h.p. per ton of refrigerating capacity less than those for an all-electric job. This low power input usually eliminates the necessity of a special power line for short period usage.

3. FREEDOM FROM NOISE AND VIBRATION

Air-O-Matic Absorption Units offer freedom from noise and vibration due to a complete lack of reciprocating parts. This feature is particularly advantageous for large installations where zoning is desirable and the refrigerating equipment is installed adjacent to each of the several zones.

4. SIMPLICITY OF MECHANICAL PARTS

The only moving mechanical part in an Air-O-Matic Absorption Unit is a small rotary pump-motor unit. To achieve the ultimate in simplicity and trouble-free operation this unit is so designed as to eliminate the use of a seal.

5. LOW OPERATING PRESSURES

Normal low-side operating pressure is within a range of 21 to 24 inches mercury vacuum and the high-side pressure within a range of one to three pounds gauge. When the machine is idle, the high-side and low-side pressures equalize at 15 to 20 inches vacuum, depending on the room temperature. Such low pressures in the absorption unit makes exceedingly remote the possibility of losing a refrigerant charge either when the unit is in operation or when idle.

6. FREEDOM FROM FIRE AND TOXICITY HAZARDS

The refrigerant has been accepted as "safe"—with respect to both fire and toxicity hazards—by the most exacting municipal codes, while the solvent is a non-volatile, inert, odorless chemical with a boiling point of 527°F. and a flash point of 278°F.

7. FLEXIBILITY

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8. TROUBLE-FREE OPERATION

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BLOOMINGTON, ILLINOIS

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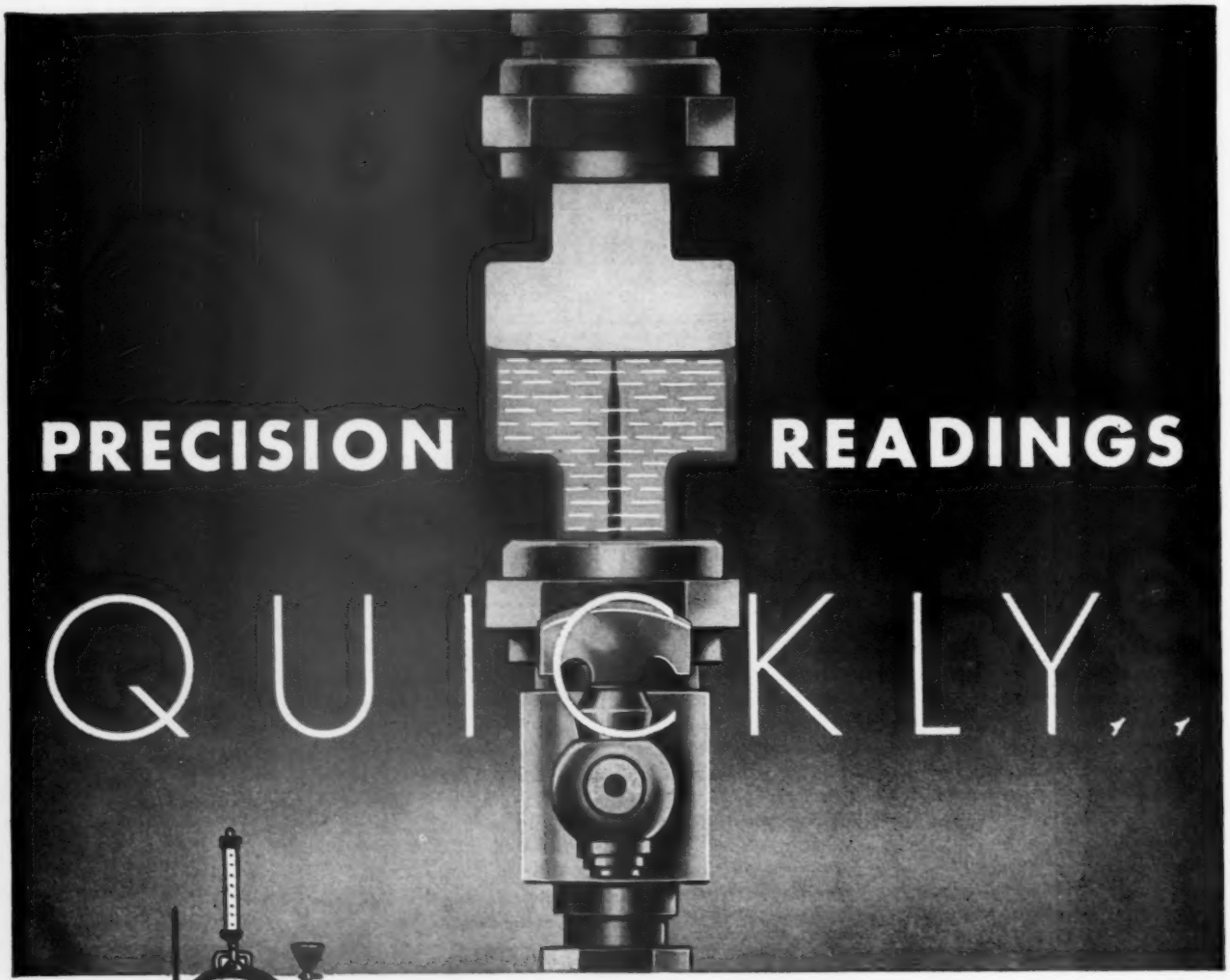

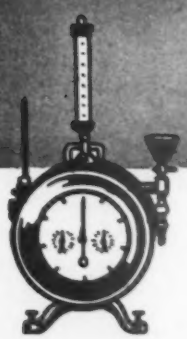

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OCTOBER 1945

AMERICAN GAS JOURNAL

VOLUME 163 No. 4

Training Gas Heating Appliance Dealers

By
Fred A. Herr

RECOGNIZING the fact that in Southern California plumbing and heating are becoming steadily more closely allied since many of the major plumbing dealers have taken on a line of heating equipment, the Institute of Gas Heating Industries of Southern California, in collaboration with the Southern California Gas Co., is sponsoring a program for training gas heating appliance dealers.

The initial series of free classes of the Institute's Installers' and Servicemen's School for heating company personnel, completed in June, was so successful, that the Institute made arrangements to sponsor a second class this fall to which master and journeymen plumbers interested in heating installation work will be admitted on an equal footing with heating contractors and journeymen.

Installation training is being sponsored by the Institute concurrently with a comprehensive program of heating appliance sales training and merchandising tied in with similar campaigns being conducted by merchant plumber associations to the end that plumber dealers handling heating equipment will be properly alerted and adequately trained to participate in the large market for gas heating appliances that will soon open up, now that the war has ended on both fronts.

Louis M. Hull of the Hammell Radiator Engineering Co., Culver City, Calif., president of the Institute, in defining the objectives of the installer training program, pointed out that, with the war ended, many operators, new to the venture, will be drawn to the business of installing gas heating equipment. Surveys made on the Pacific Coast, Mr. Hull declared, confirmed the opinion that the success attained by the gas heating industry in the prewar period appears attractive to a large group of merchandisers who had had no previous experience in that field. Many of them, according to Mr. Hull, have overlooked the detailed and technical knowledge required to make a proper installation of gas heating equipment and have been swayed largely by the attractiveness of predictions which indicate that there is due a period of wholesale installations of modern, automatic heating systems.

Trend Toward Plumbers Seen

The entire gas industry on the Pacific Coast, including utilities, manufacturers and heating contractor groups, apparently became aware of this trend before the end of the war was in sight. Considerable thought during the past several years was devoted to the development of a policy which would insure proper installation and service to the gas heating consumer.

Louis M. Hull

Due thought also was given to the fact that in some areas it has been felt that restrictions on installers should be made so rigid that it would be virtually impossible for outsiders to enter the field, while in other areas of the country the conviction prevailed that the newcomers should be encouraged to learn from those who have had years of experience in gas heating installation.

The Institute of Gas Heating Industries of Southern California decided to adhere to the second of the theories cited above. Early in 1945, the Institute initiated a definite plan which, judging by the results of the first class, appears to have produced an answer to the complex problem of training gas heating appliance installers.

The program of training installers is the fourth and most recent major step undertaken by the associated heating equipment manufacturers of the Los Angeles area to promote wider acceptance of gas heating.

In 1940 a group of men in Los Angeles representing manufacturers of gas heating equipment, installers of such equipment, and manufacturers of control devices used in house heating, formed the Institute of Gas Heating Industries. J. S. Andrews, head of the Andrews Heater Co., Los Angeles, was the first president.

The purpose of organizing into such a group was:

1. . . . To develop new and improved standards of gas heating installation.
2. . . . To promote the use of natural gas and gas heating equipment.
3. . . . To encourage the adoption of

and to cooperate in the development of laws, regulations and ordinances to insure safe and satisfactory gas heating installation.

4.... To initiate, through the cooperation of other organizations, programs which would enhance the safety, promote education and generally improve conditions in the gas heating industry.

Registration of Heating Installers

The Institute's first step in this plan was to develop a heating installers' registration. The Institute, with the assistance of the Southern California Gas Co. and Southern Counties Gas Co., succeeded in having passed by the city council of Los Angeles an ordinance under which each company installing heating equipment within the city is obliged first to prove its ability and technical knowledge of the subject by having a firm representative pass a qualifying examination. The successful individual representing the firm is issued a master heating installer's license. Individuals working under the master installer, who has direct charge of field crews, must take a less comprehensive examination, for which a journeyman's license is issued.

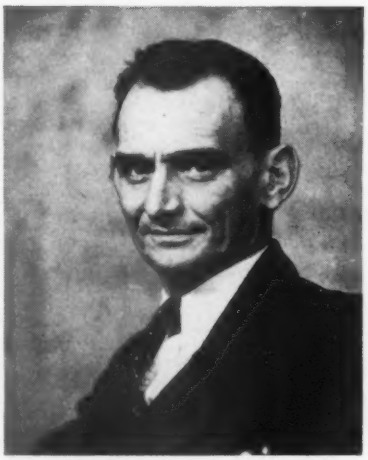
All examinations are conducted by the Los Angeles Board of Building and Safety under the jurisdiction of a board of examiners and with the cooperation of the civil service examiners.

This procedure, in effect now for several years, has been instrumental in raising the standards of gas heating installation by barring from such work men insufficiently trained to do an efficient job. While adoption of the ordinance was preceded by objections from individuals and groups who interpreted the move as an attempt by established heating contractors to keep plumbers and others who make occasional installations out of the field, the ordinance now is regarded as one of the most progressive steps ever undertaken by the heating industry of any city. It has accomplished the specific purpose for which it was designed; The development of improved standards of gas heating installation.

The existence of the ordinance has reacted favorably to the industry in a two-fold manner:

It has prevented unskilled men from making inefficient installations; and it has acted as a spur to cause many operators to study proper techniques of heating installation in order that they would be able to pass the examination and be certificated by the city.

The Institute's second step was the development of a simplified heat loss calculation chart for use in properly sizing heating equipment for the typical Southern California home. (see *American Gas Journal,* January, 1943, issue, Pages 16-21).



Michael Johnstone

As the third step, through the efforts of the Institute and with the cooperation of the Los Angeles Chamber of Commerce and the Municipal Board of Building and Safety, a new ordinance covering heating and ventilating was presented to the city council. Heating engineers who have studied the code have expressed their opinion that it represents the most forward piece of work of its kind which has been accomplished in the United States.

Training Gas Heating Installers

The fourth and most recent undertaking of the Institute is the training of gas heating installers and service men. During the spring of 1945, the Institute, with the cooperation of the Southern California Gas Co., offered its first class of instruction for heating installers and service men in the Los Angeles area.

This class work was carried out by the Institute's Educational Committee, of which Michael Johnstone of the gas company is chairman, with Glenn Ashburn, Ashburn Bros., Heating, Inc., Los Angeles, and Arthur Theobold, Payne Furnace Co., Beverly Hills, as committee members.

The majority of the classes were held in the auditorium of the Southern California Gas Co.'s Hollywood branch. Mr. Johnstone served as instructor, assisted by Robert McKee of the gas company.

The course covered a period of nine weeks, with classes held once a week. The first class was completed on June 5. Attesting to the interest of the students is the fact that all those who originally enrolled in th course finished it. The average weekly attendance was 45 students, representing 14 heating contracting companies in Los Angeles and surrounding area.

Instruction covered the fundamentals of gas combustion, gas flow, the chemistry and composition of fuel gases, gas appliance controls, control systems and trouble shooting. The Southern California Gas Co. furnished numerous control systems on specially designed boards which permitted ready assembly and disassembly of typical control setups and manifolds. One feature of the class work was for students to construct a manifold so that it would perform improperly. Places then were exchanged and a new group of students was asked to unravel the misassembly and reconstruct a workable control arrangement.

Second Class Formed

The results obtained through the classes in heating appliance installation and servicing were so gratifying and the Institute was so pleased with the attitude taken by the students and by the high calibre of men who attended, that the Institute's board of directors decided to present certificates of completion to each student who finished the course in satisfactory manner.

The certificates attests that the student has satisfactorily completed the following subjects in the Institute's Installers and Servicemen's School: Combustion, venting, fundamentals of electricity, safety pilots, push button controls, wiring push button controls, forced air furnace controls, wiring forced air furnace controls, thermo-couple operated controls and adequate knowledge of the provisions of the Los Angeles Warm Air Heating Ordinance.

Graduation Certificates Presented

A dinner meeting was held in the Mayfair Hotel, Los Angeles, June 14, attended by heating manufacturers who hold membership in the Institute, and representatives of the Southern California and Southern Counties Gas Company, Merchant Plumbers Association of Los Angeles, Federation of Master Plumbers of Southern California, merchant plumber groups of various other cities, the American Society of Heating and Ventilating Engineers, and other organizations associated with the business of gas heating. At this dinner, President Hull of the Institute presented certificates to 50 graduates of the installers' school.

The first series of classes was regarded as so successful that President Hull announced the Institute's intention of sponsoring another parallel course for additional servicemen and installers as soon as arrangements could be made. The second course will be open to all installers of gas heating equipment, including master and journeymen plumbers as well as employees of heating contractors.

Gas Co. Plumber Classes

In addition to directing classes in heating installation for the Institute, Mr. Johnstone served as instructor on other subjects of gas appliance installation and servicing in classes consisting of members of merchant plumber associations of various Southern California cities. These classes were sponsored directly by the Southern California Gas Co. Typical of such classes is the one illustrated, which shows Mr. Johnstone giving instruction to a group of members of the Glendale, Calif. Master Plumbers Association in dismantling, assembling and adjusting gas water heaters.

This type of class has been held two hours each week on a 10-week schedule. Employing the "learn by doing" principle, Mr. Johnstone presents instruction designed to keep the servicemen abreast with current developments in gas appliances by dismantling controls, thermostats, burners, etc., finding out how they operate and then reassembling them.

Promoting Gas Heating Sales

Gas heating equipment manufacturers, through the agency of the Institute of Gas Heating Industries, also have paved the way for closer cooperation with Southern California plumber dealers for merchandising heating equipment in the postwar period through a competent intra-industry plan designed to promote greater sales of gas heating appliances.

A big step toward instrumentation of this plumber-manufacturer cooperative plan was taken at a recent meeting of the merchandising committee of the Los Angeles Merchant Plumbers Association, at which President Hull of the Institute and Ted Waite, chairman of the plumber merchandising committee, exchanged ideas for mutually promoting the merchandising of gas heating appliances.

The meeting was so promising of potential results that it was referred to as marking the beginning of a new era in the relations between heating manufacturers and merchant plumbers in Southern California. Principal accomplishment at the meeting was the establishment of mutual confidence which is expected to serve as the basis of a broad collaborative program.

One result of the meeting (which was held prior to the June 14 graduation dinner) was the reaching of an agreement to admit plumbers and journeymen plumbers to the second series of heating installation classes to be sponsored by the Institute.

Another result was the adoption by the heating manufacturers and plumber dealers of a plan for a series of campaigns to educate the public on gas heating subjects and to correlate the promotion campaigns of the Institute and the Los Angeles Merchant Plumbers Association.

Manufacturer-Plumber Joint Plan

As part of the joint plan, a number of separate campaign operating units were set up. Each unit was headed by a gas heating appliance manufacturer. The plan called for each unit chairman to promote educational and merchandising work on gas heating, using his present plumber clients and prospective customers as the nucleus on which to concentrate the efforts of the unit.

The plan also provided for each of the units to tie in its publicity with a display advertising campaign which the Institute of Gas Heating Industries has been conducting in Los Angeles newspapers since the spring of 1945 for the purpose of creating goodwill for gas heating in homes, office buildings, stores, factories, etc.

Anotner phase of the plan was for each unit to take full advantage of the classes in gas heating installation and servicing sponsored by the Institute.

Since it was regarded as impractical for the local plumbing industry to tie in satisfactorily with advertis-

Typical of the classes in gas appliance servicing conducted by Mike Johnstone of the Southern California Gas Co. is this group of members of the Master Plumber's Association of Glendale, Calif., engaged in dismantling, assembling and adjusting gas water heaters. Instructor Johnstone is seen standing at far right.

ing programs conducted in national magazines by appliance manufacturers, the Merchant Plumbers Association of Los Angeles decided to attempt to link their industry promotion with heating advertising of the Institute. To this end the plumbing industry prevailed upon the Institute to insert a "plumber angle" in its heating advertising.

Gas Heating Ads in 40 Newspapers

Institute display advertisements, keyed to the theme "Service Your Equipment Now!" appeared in 40 metropolitan and area newspapers in the systems served by Southern California Gas Co. and Southern Counties Gas Co. which covers the southern block of counties in California The copy emphasized the need on the part of the public for keeping existing heating equipment in proper repair so that it will last until new equipment appears on the market.

A short publicity story, carrying the same message, was also released. Tear sheets of the advertisements were sent to Institute members by President Hull with the request that members be prepared to act on any service calls they might receive or to turn the calls over to other service agencies.

The plumbing industry of Los Angeles and surrounding communities is now devising a plan whereby plumbers, who have proven their ability to meet Institute standards in respect to heating installations, can tie in their own advertising with the Institute's program and also obtain Institute collaboration that will enable plumbers to follow up the Institute promotion with direct mailing, plus advertising and promotion material supplied by heating manufacturers.

While the general objectives of the manufacturer-plumber unit campaigns were identical, the advertising and promotion of each unit were linked with the trade-marked product of the manufacturer heading each unit. The general plan was for the advertising department of the heating equipment manufacturer to plan and direct the advertising campaign for his unit by preparing and coordinating advertising and promotion material which, in its larger aspects, was designed to harmonize with the Institute's general program for educating the public to a desire and understanding of gas heating.

Individual plumber-dealers participated by contributing some of their own facilities and resources by promoting the program through such means as displays in store window and salesroom; signs or posters on trucks; and personal ads in neighborhood newspapers and slides in local film theaters.

Many Los Angeles plumbers participated in heating promotion by using four different types of placards designed for truck and window display.

Below a main slogan "Your Plumber Knows Best!" which appeared on each placard, were such messages as these: "About Present Equipment, Upkeep and Future Equipment Needs"; "About Home Service and Convenience"; "About Home Heating and Cooling"; "About Public Health and Home Comfort."

Mutual Obligations Conceded

In its heating promotion campaign, the Los Angeles plumbing industry is proceeding on the principle that sound merchandising will control the success of heating equipment sales for both the manufacturer and the merchant plumber. The plumbing industry believes that merchandising of heating equipment will develop, substantially, along lines which have controlled the merchandising of other products; These are:

That the merchandising of gas heating equipment will be governed by general merchandising experience; that independent straight line merchandising must not be handicapped; that the manufacturer has definite obligations to the retailer, and conversely, the trade to the manufacturers; and that the engineering, advertising and business-aid activity must be sponsored by the manufacturers.

Encourage Plumber Heating Work

The obligations of the manufacturer were admitted by J. S. Andrews, president, Andrews Heating Co., Los Angeles, and a past-president of the Institute, in an address at a recent meeting of the merchandising committee of the Los Angeles Merchant Plumbers Association.

"Like most manufacturers in the gas heating industry I want the plumber to be a successful heating merchant," Mr. Andrews said. "And I will go much more than half way in cooperating to that end. I believe that it is to the interest of the heating industry that the merchant plumber be encouraged, supported and strengthened as the retail outlet for the sale and installation of heating equipment, particularly in the home.

"If a sufficient number of plumbers can be induced to participate continuously in the development of the gas home heating market, and will do their part in protecting the manufacturer in legitimate merchandising activities, manufacturers will, as a rule, benefit enormously. I am certainly in favor of backing every merchant plumber who wants to do a merchandising job in the heating field. We want plumbers to become recognized as the authorities on home heating and to justify this recognition by doing all that is necessary to qualify themselves technically for the job."

Gas Co. Sales Training

Anticipating a brisk competitive market, the Southern California Gas Co., through its sales training staff, has prepared a sales training course for dealer personnel. Nationally developed principles, adapted to local conditions and inventories, are included in the program, which is directed by R. C. Terradell, the company's supervisor of sales training.

The company has arranged to present the sales training program to dealers throughout its system along lines similar to the gas appliance service training it has offered in the past, and the heating installation service it is currently making available under the direction of Michael Johnstone.

The time and place of the sales training courses are adjusted to the mutual convenience of both the dealer and the gas company. The most modern and tested methods have been incorporated in the course, including actual demonstrations, sound films and film strips and other visual training aids to supplement lectures by experienced instructors.

"In the postwar period which began in mid-August there will be many gas appliance sales floors, each arranged to attract favorable customer attention and each manned by the most competent sales personnel that the dealer can employ," Mr. Terradell said. "Prospects know that the water heater on a dealer's floor will heat water, that a range will cook, a heater will heat and a refrigerator will refrigerate.

"What they want to know is whether they will do those things better over a longer period of time, more economically and more dependably than those they saw yesterday and the day before on other display floors. To tell this story to the greatest advantage calls for specialized sales training, which is what Southern California Gas Co. is offering in its sales training courses for dealers and dealer groups."

The Utilization of Hydrocarbon Gases in the Production and Distribution of Manufactured Gas

By
E. G. Boyer

Manager, Gas Department
Philadelphia Electric Company

WE ARE ALL familiar with what the gas industry is now going through and with the necessity it now faces of making plans to meet the competition and acquire the potential new business that may be expected in the post-war period. Much interest is aroused by the possibility of acquiring additional house-heating load, and the industry has a perhaps unique opportunity in that direction because of the dissatisfaction of an appreciable section of the public with the difficulty of obtaining an adequate supply of competing fuels. The increase in the cost of these fuels has not allayed this situation.

I think you will agree with me that general public interest in gas house-heating has seldom been so keen as at the present time. Of course, in our campaigns for new business we must not neglect the other types of residential sales, such as cooking, water-heating and the latent market for air conditioning, nor the important commercial and industrial classification. However, I have emphasized the potential house-heating load because, with its seasonal characteristic and high peak demand, it presents a serious problem to the gas company that knows the public interest is there but wonders how much of this load it would be wise to acquire.

If it is to profit by this situation, the gas industry must solve three problems: first, it must produce gas more cheaply; second, it must provide peak production capacity with the minimum of investment per M.C.F.; and third, it must minimize the cost of distributing its gas, particularly where seasonal loads cause mains to be idle for part of the year.

We feel that our experience in the Gas Department of the Philadelphia Electric Company over the last fifteen years has gone a long way towards solving the first two of the problems I have mentioned, and I want to point out how others, we believe, can duplicate our results to a great degree by using LP gases in place of the refinery oil gas we use.

I wish also to call to your attention information that we have collected on the experience of others in the use of liquefied petroleum gases to augment production capacity to meet peak loads and to supply territories not served by company mains of adequate capacity.

Experience at Chester

In 1930 or 1931, our Tilghman Street Plant in Chester, consisting of four 9′x10′x10′ mechanical generator carburetted water gas sets and one 10′ O.D. hand-clinkered carburetted water gas set, would have had an installed production capacity of 27,000 M.C.F. per day, based on capacity of 6,000 M.C.F. per day for each mechanical generator set. Today, because of the development of the reforming process that has occurred over these years, the installed production capacity of this plant with the same sets is 46,000 M.C.F. per day; an increase of 70 percent.

Each mechanical generator set can produce slightly more than 10,000 M.C.F. per day. This additional production capacity of 19,000 M.C.F. per day has been supplied for an additional investment since 1931 of $180,000 representing about 8.1 percent of the total 1931 investment in the plant.

While at present affected by war conditions, our production cost of reformed oil gas is still comparatively low. You can visualize how much the cost would be reduced due to lower fixed charges and conversion cost alone by a 70 percent increase in a capacity. We are not realizing this full benefit at present because we are purchasing a considerable amount of gas under a long-term contract negotiated before our present process was developed.

The reforming process is well adapted to increasing plant capacity. The gas produced on the sets is of low specific gravity (about 0.45) and has a heating value of 500 to 600 B.t.u. per cubic foot. Thus, to produce a gas having a heating value of 520 B.t.u. and 0.68 specific gravity, considerable blow run and cold-enriching is used. The cold-enriching gas is added just before the purifiers if it contains H_2S, and therefore does not pass through the off-take main, scrubbers and exhausters. The blow run gas is largely produced during a part of the cycle normally devoted to blowing the fire and therefore minimizes the additional load imposed on off-take main and scrubbers by lengthening the gas-making portion of the cycle. Installation of an equal amount of additional capacity as water gas sets would not do this and would place relatively more load on this apparatus. The enriching gas and blow run gases may comprise 30 to 40 percent of the total production.

We use only about six or seven pounds of generator fuel per M.C.F. produced. Thus, even considering the additional capacity of the sets, the load on the coal and ash handling equipment is reduced. Less room required for coke storage makes available room for LP gas storage.

Finally, because of the burning characteristics of the slow-burning, high-gravity hydro-carbons and blow run gases, the reformed gas is interchangeable with coke oven or coal gas to a much greater degree than carburetted water gas with its large proportion of fast-burning hydrogen and carbon monoxide.

Reforming Oil Gas

The reforming of refinery oil gas as it is now carried out by P. E. Company is a process which is the result of nearly twenty years of experimentation and development. The first experiments made by the U. G. I. on the reforming of refinery oil gas were carried out in the physical laboratory of Station A of The Philadelphia Gas Works Company in 1927. Experimentation upon a full-size carburetted water gas set during the following summer resulted in the accumulation of data and results which apparently indicated a prac-

tical method of reforming. However, since each of the series of test runs made was only of two or three days duration, it was impossible to tell how the proposed method would show up under conditions of continuous day in and day out operation. This was an extremely important consideration because the purpose of this work was to develop a process for base load service, not simply for peak load operation, because aside from other reasons, it would be desirable to make a contract with the oil company supplying the refinery oil gas which offered the refinery an attractive load factor. The results of the experimental work in the summer of 1928 were so promising, however, that it was not anticipated that continuous operation would offer any difficulties and it was also felt that the process, as developed, using a refinery oil gas containing hydrocarbons of the paraffin series almost exclusively would be equally applicable to most hydrocarbon gases.

On August first of the following year, an attempt was made to utilize at the Tilghman Street Plant of the Philadelphia Electric Company at Chester, the process as it had been experimentally worked out during the previous summer. The first attempts were made on a 10-foot hand-clinkered carburetted water gas set because at that time the two new 9-foot internal diameter mechanical generator carburetted water gas sets, which were being installed to provide additional capacity at the plant and with the hope of utilizing them for the new process, had not yet been completed. Within about one week after being put in service the hand-clinkered water gas set was shut down due to excessive back pressures which made it impossible to keep the stack valve closed. Investigation revealed that the condenser was almost completely filled with a thick pitchy deposit of tar and lampblack which was only removed after several days of steaming and washing out with tar. When the condenser was restored to service the set was started up again, but within a few days increasing back pressure indicated that the same trouble was recurring. After some experimentation it was decided to admit steam to the set at the same time as the oil gas was admitted, and this was found to improve the operation somewhat, although it did not eliminate the trouble by any means. It might be pointed out that the process, as developed in the experimental work in Station A in the summer of 1928, was carried out according to a cycle which consisted of a long preliminary steam run, either up or down, directly after the blow, followed by a long oil gas run during which oil gas alone was passed through the fire in the direction opposite to that of the long preliminary steam run. The oil gas run was followed by a short steam run. At Tilghman Street, it was hoped that the admission of steam, together with the oil gas, would tend to reduce the lampblack, formed by the breaking down of the refinery oil gas, by causing the oxygen produced by the breaking down of the steam to react with the carbon liberated from the oil gas. This probably occurred to some extent, but the trouble with lampblack being carried from the set continued and, in addition, great difficulty was experienced in maintaining the fire in the generator in a good condition. Cold, inactive spots would be formed where the oil gas impinged at the top or bottom of the fire and some portions of the fire would plug up and blow holes would result. The deposition of carbon from the oil gas near the grate where it subsequently burned off during the blow created excessive local heating with the result that part of the grate of the hand-clinkered set was burned out.

Generator Sets

While these troubles were being encountered the mechanical generator sets were completed and put in service, but troubles were still experienced. The pusher angles on the ash pan of the mechanical grates were subjected to the local heating just mentioned, and the bolts which secured them were burned out and the pusher angles warped out of shape so that they did not remove the clinker properly. Cracks also appeared in the casting at the bottom of the set due to overheating. High condenser back pressure was still encountered. Throughout the winter of 1929-1930, these difficulties continued, although it was necessary to keep the equipment in continuous operation to meet the load requirements so that expedients such as patching the cracks in the generator casting and flushing the condenser and offtake pipe with tarry water to keep it free were resorted to. Some trouble was also encountered with the production of excessive quantities of naphthalene. Throughout this period a constant study was being made of fire temperatures and conditions since it was felt that improper conditions of this sort might at least be a contributing factor to the trouble that was being experienced. By the spring of 1930 it was felt that the proper method of controlling the fire had been determined and that the operation could be carried on continuously with fairly good results.

Analysis of Operation

In reviewing the trouble up to this time, it appeared that it resulted from a number of misconceptions that were held as a result of the relatively short experiments that had been made in the summer of 1928. As a result of these experiments it was felt that, in order to retain the carbon in the fire and avoid its being carried out of the set as lampblack —which would cause stoppages and decrease the efficiency of the process—it was necessary to keep the flow rates to the minimum. The long preliminary steam run was considered necessary to cool the fire which prevented over-cracking of the refinery oil gas and, by reducing the temperature of the fire, kept down the velocity of the oil gas as it passed through, thus avoiding the carrying out of lampblack. The emphasis laid upon low flow rates as a result of the Station A experiments was such that, although the capacity of a 9-foot mechanical generator carburetted water gas set at that time was at least 5,000 M.C.F. per day and had reached 6000 M.C.F. per day by 1929 or 1930, the expected capacity of the same equipment when reforming refinery oil gas was stated in December, 1928 to be not more than 4,500 M.C.F. per day under the most favorable conditions. This was in spite of the fact that this process obviated the need of vaporizing approximately three gallons of gas oil per M.C.F.

By the spring of 1930 the operation at Tilghman Street had brought out that the theory of low flow rates was incorrect and that to assure the retaining of the lampblack in the fire it was necessary instead to control the temperature and condition of the fire so as to crack the oil gas at the surface of the coke rather than in the space or interstices between the pieces of coke. This is simply an application of the principle of surface cracking which had been observed in the laboratory long before time. It was found that a fire temperature of not over 1,200 deg. C. (about 2,200 degrees F.) was necessary. This temperature was high enough to cause the conversion of steam used in the process to blue gas at a fairly rapid rate, but at the same time was low enough to cause the methane in the oil gas to crack on the surface of the coke and not in space. At this temperature the higher and less stable hydrocarbons

did crack in the space between the pieces of coke, but since they produced a large amount of methane in doing so (which in turn cracked on the coke surface) relatively little lampblack was carried out of the set. The carbon released by the "surface cracking" of the methane deposited on the surface of the coke and reacted with oxygen from the steam to produce CO or with oxygen from the air during the blow to heat the fire. While it might be considered that this conception of surface cracking was purely a theoretical one, some visible proof of its occurrence is available. Pieces of coke which were taken from the fire showed a deposit of carbon on their surface, and laboratory experiments have shown that, up to about 1,200 degrees C., the breaking down of methane is a surface phenomenon, while above that temperature the breaking down occurs more and more in space.

The discovery of this principle as applied to our process was very important in that it led to the abandonment of the restriction on flow rates. We are now putting the refinery oil gas together with steam through the fire at a combined rate of flow about three times as great as the maximum considered possible for the refinery oil gas alone in 1928. As a result, we combine the oil gas and steam runs and carry out this combined operation for practically the entire cycle, and this has been the principle contributing factor to the very high set capacity which we are able to obtain today. Today we are reforming more than twice as much refinery oil gas per set day as in early 1930.

Surface Cracking

Although the principle of surface cracking was recognized early in 1930, and the knowledge of the proper fire condition to obtain this type of reaction was fairly good at that time, there still was much to be learned and it wasn't until nearly the end of 1930 that it became possible to put refinery oil gas and steam through the fire for the greater portion of the cycle. Up until that time our knowledge of fire control was insufficient to prevent lampblack trouble if we attempted to do this, although we realized by that time that it was necessary to do this to obtain the maximum set capacity. I might add that up until January of 1930 the maximum set capacity was slightly less than 4,500 M.C.F. per day, the figure predicted on the basis of the experimental work at Station A.

It was also realized that the reforming of hydrocarbon gases was not such a simple matter as we had previously considered, and that one of the factors which contributed to the trouble we had was that the composition of the oil gas used at Tilghman Street was slightly different from that at Station A, containing an appreciable percentage of olefin hydrocarbon gases.

Scrubber Experience

I have referred to the trouble encountered with lampblack and the plugging up of the condensers. During 1930 a lampblack scrubber was installed in connection with the new mechanical generators and this was put in operation to replace the condensers. It is indicative of the lampblack trouble we were still experiencing that within a month after this lampblack scrubber was put in service (about September, 1930) it had to be shut down and was found to be completely plugged up with the same combination of lampblack, pitch and naphthalene which had caused trouble in the condensers. As our knowledge of controlling fire conditions improved, this trouble was overcome and the lampblack scrubber now operates with perfect satisfaction.

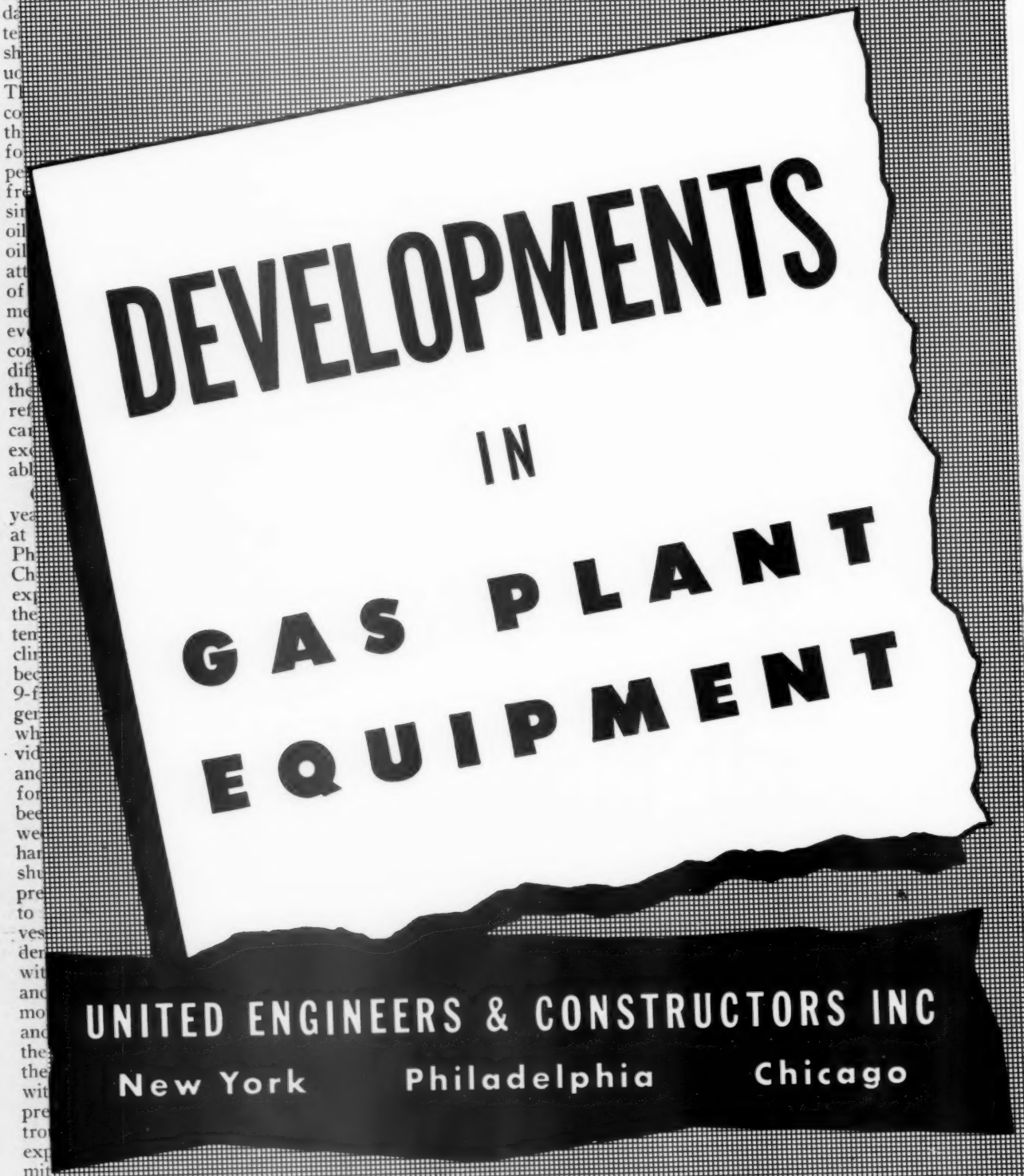
Blowers

I have referred to the higher rates of flow of steam and oil gas that we have utilized, and the contribution that these have made to increased set capacity. Also of great importance is the increase that we have made in our air rates which resulted from the installation of blowers of greater capacity at higher air pressures. A blower of this type was installed in 1930 and another subsequently. Our original blowers have been redesigned and one of them recently was replaced by a newer blower of more modern design. These changes have permitted us to greatly increase the rate at which air is blown through the fire, both during the blow and blow run, with the result that the time required for these portions of the cycle has been reduced and the gas-making period lengthened, despite higher oil gas and steam rates.

As originally operated there was no blow run used with the reforming process. It was originally intended that this process should provide a type of gas readily interchangeable with coke oven gas so as to utilize the carburetted water gas sets interchangeably with coke ovens without encountering specific gravity trouble with customers' appliances. The specific gravity of the gas produced, therefore, during the early operation was approximately 0.50 to 0.54. In February of 1930 a very short blow run was introduced into the cycle and this has gradually been increased until, by 1941, the blow run amounted to approximately 15 percent. Although an important contributor to our increase in capacity, if a quantity of blow run gas sufficient to increase the specific gravity to 0.68 (our present level) had been added to the approximately 4,500 M.C.F. per day of 0.50 gravity gas, (which was manufactured on a set early in 1930) the capacity of the set would have been increased only to about 6,500 M.C.F. per day as contrasted to our present daily capacity of over 10,000 M.C.F. However, the blow run did contribute to an appreciable extent to increasing the set capacity. It also was valuable in that the reaction by which carbon dioxide is reduced to carbon monoxide, which takes place in the upper part of the fire during the blow run, tends to reduce the temperature in that part of the fire somewhat. This has permitted us to practically eliminate the preliminary steam run which was used in the early operation to temper the fire so that at the present time our steam runs consist only of short purges at the beginning and end of the run portion of the cycle. All the rest of the cycle is devoted to passing oil gas steam through the fire, and as previously mentioned this has greatly increased our set capacity. As a tempering medium the blow run has an advange over the steam run in that it is adding heat to the fire and not taking heat out, and thus permits using a shorter blow. The introduction of blow run naturally resulted in an increase in the specific gravity of the reformed gas so that the percentage of blow run was increased very slowly to permit us to observe the performance of the gas to avoid trouble with customers' appliances. The maximum specific gravity of the reformed gas was 0.60 in 1930, and for a number of years thereafter the specific gravity sent out was held at 0.63.

Interchange of Gases

Part of the gas requirements of the P. E. Co. system (about 40 to 45 percent) is supplied with purchased coke oven gas and because of the layout of our system, one portion of our territory was alternately furnished with this coke oven gas and with gas from our Tilghman Street Plant, which was predominantly reformed oil gas. The specific gravity of the

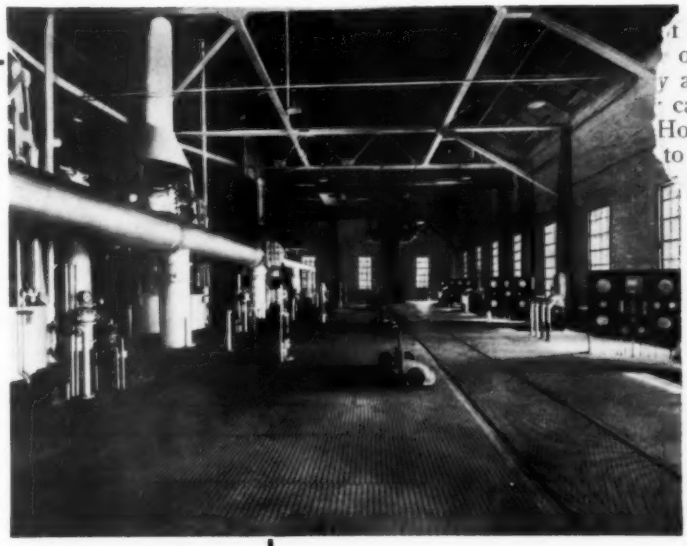

DEVELOPMENTS
IN
GAS PLANT
EQUIPMENT
UNITED ENGINEERS & CONSTRUCTORS INC
New York Philadelphia Chicago

UGI Equipment

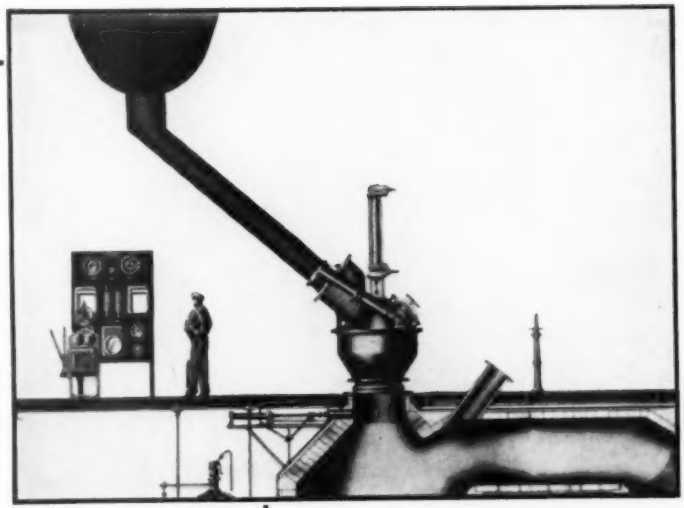
DEVELOPMENTS IN GAS PLANT EQUIPMENT

UGI GAS REFORMING PROCESS
FOR REFINERY OIL GAS, NATURAL GAS AND LIQUEFIED PETROLEUM GASES

OUTPUT PER SET DAY
over 10,000,000 cu. ft.
of
520 Btu 0.68 Specific Gravity
REFORMED
OIL REFINERY GAS
PLUS COLD ENRICHMENT



UGI AUTOMATIC
FUEL CHARGER
for
WATER GAS
GENERATORS



UNITED ENGINEERS & CONSTRUCTORS INC

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UGI Equipment

DEVELOPMENTS IN GA

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1926

11′ UGI Hand Clinkered Carburetted Water Gas Sets

Inside Diameter—At Grate 9 ft.
At Top.. 9 ft.

MAKE PER SET DAY
(Guarantee Test)

4,260,000 cu. ft.

of
530 Btu 0.69 Specific Gravity
CARBURETTED WATER GAS
WITH GAS OIL

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10′ x 9′ UGI Mecha
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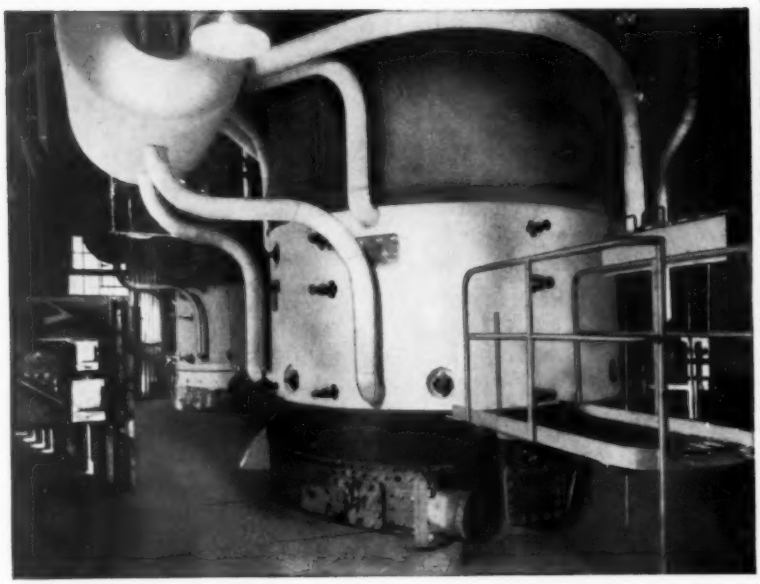

1944

I Mechanical Generator
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meter—At Grate 9 ft.
At Top.. 10 ft.

AKE PER SET DAY
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,000 cu. ft.

(Estimated)
of
0.69 Specific Gravity
RETTED WATER GAS
TH HEAVY OIL

1945

10′ x 9′ UGI Mechanical Generator
Carburetted Water Gas Sets

Inside Diameter—At Grate 9 ft.
At Top.. 10 ft.

MAKE PER SET DAY
(Two Weeks' Test)

10,059,000 cu. ft.

of
530 Btu 0.70 Specific Gravity
CARBURETTED WATER GAS
WITH HEAVY OIL

& CONSTRUCTORS INC

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TABLE I Comparison of Hydrocarbon Gas Data and Calculated Performance Reforming Various Hydrocarbon Gases

Item No.		1	2	3	4	5	6	7	8
1	Date	11/17/36	1/6/38	4/13/38	4/25/38	12/2/41	10/29/42	-	6/16/43
2	Kind of Hydrocarbon Gas	Pure Oil	Sinclair Oil	Sinclair Oil	Sinclair Oil	Sinclair Oil	Sinclair Oil	Commercial Gases: Propane	Butane
3	Average Hydrocarbon Formula	$C_{2.28}H_{5.75}$	$C_{2.11}H_{5.87}$	$C_{2.00}H_{5.76}$	$C_{1.86}H_{5.49}$	$C_{1.99}H_{5.70}$	$C_{2.26}H_{6.04}$	C_3H_8	C_4H_{10}
4	B.t.u. Per Cubic Foot	1,662	1,545	1,585	1,536	1,603	1,734	2,550	3,200
5	Specific Gravity	0.976	1.004	0.961	0.912	1.010	1.097	1.523	1.950
6	Volumetric Ratio H:C	2.58:1	2.87:1	2.96:1	3.01:1	2.89:1	2.70:1	2.67:1	2.50:1
7	Cubic Feet Per Therm	60.1	64.7	63.1	65.1	62.4	57.6	39.2	31.2
8	#C/Therm	3.79	3.78	3.59	3.51	3.58	3.73	3.72	3.94
9	Make Per Set Day - MCF*	8,650	7,960	7,120	7,120	10,110	8,720	-	8,250**
10	Calculated Specific Gravity of Set Gas Less Blow Run	0.457	0.449	0.447	0.445	0.449	0.454	0.454	0.459
11	Calculated Volumes of 0.68 Specific Gravity, 520 B.t.u. Enriched Reformed Gas per Volume of Set Gas Less Blow Run	1.64	1.65	1.68	1.72	1.65	1.59	1.49	1.44
12	Calculated Capacity in MCF/Day Based on 1941 Operation	10,070	10,110	10,300	10,530	10,110	9,750	9,140	8,830
13	Specific Gravity Hydrocarbon Blow Run Mixture	1.028	1.035	1.022	1.005	1.038	1.064	1.142	1.189

*Average for Month Sample was Taken.
**Based on one-day Test Run.

coke oven gas was about 0.40, while that of the Tilghman Street gas was 0.63; the difference being generally considered too great for interchangeability. However, we discovered that over a period of years these gases could be interchanged without very much difficulty. The conditions, of interchanging, however, were unusually severe in that the type of gas furnished might change very frequently, and with some few appliances this caused difficulty in adjustment. In 1938 our own small coke oven plant at Chester was shut down and from then until 1942 all the gas sent out from Tilghman Street Plant was reformed oil gas. Until 1940 this was interchanged as previously described with the purchased coke oven gas in part of our territory.

In 1940 steps were taken to avoid the relatively minor appliance difficulty we had experienced, and provisions were made to prevent these gases from being directly interchanged. This was accomplished by providing at the West Conshohocken Plant, where the purchased coke oven gas is received, means to isolate the low gravity coke oven gas in one storage holder while a second storage holder was employed to hold a mixture of coke oven gas and reformed refinery oil gas; the mixture to be such as to give a specific gravity of from 0.53 to 0.58. When required, this mixed gas was then distributed in place of the straight unmixed coke oven gas to the territory normally supplied with reformed refinery oil gas, so that the change in specific gravity in this territory, instead of being from 0.63 (of the reformed oil gas) to 0.40 (of the straight coke oven gas) would be from 0.63 to 0.53 (of the mixed gas). Since the distribution of such mixed gas to this territory only occurred periodically, it was possible to send up to West Conshohocken a supply of reformed oil gas to be used in making the mixture of 0.53 to 0.58 gravity gas. With this type of operation, it was soon found possible to increase the specific gravity of the reformed oil gas still further, and it was raised to 0.68 in 1940, at which level it has since been maintained.

Included as Table I is some tabular data under the heading "Comparison of Hydrocarbon Gas Data and Calculated Performance Reforming Various Hydrocarbon Gases." This table lists characteristics of six samples of refinery oil gas representative of the types of this gas which P. E. Co. used in its reforming process during the period 1936 to 1942. The 7th and 8th columns give corresponding characteristics of commercial propane and butane. The data in the first six columns has been obtained from analyses of the oil gas taken on the dates shown. It will be observed that all but the first column are listed as being analyses of Sinclair Oil Gas, since that refinery has been the sole supplier of oil gas to P. E. Co. since 1937, prior to which time refinery gas was also obtained from the Pure Oil Company. The average hydrocarbon formula, which is the third item listed, shows the relative volumetric proportions of carbon and hydrogen in the combination of hydrocarbons composing the oil gas. These hydrocarbons are principally paraffins ranging from methane to small amounts of pentane, but there are also small quantities of olefin hydrocarbons as well; particularly in the Pure Oil gas. The average formulas were obtained by weighting the formula for each component by its volumetric percentage in the oil gas. It will be observed that in general the average oil gas molecule consists of about two atoms of carbon and from 5½ to six atoms of hydrogen, making this molecule only about half the size of the butane molecule and smaller than the propane molecule as well. In the same way, the heating value and specific gravity of the oil gas is appreciably below that of the commercial liquefied petroleum gases. The maximum heating value of the oil gas we have obtained has been about 2,000 B.t.u., but for the past several years the heating value has averaged from 1,700 to 1,800 B.t.u. per cubic foot.

Also important is the volumetric ratio of hydrogen to carbon since this gives an indication of the amount of carbon to be deposited in the fire of the water gas set, which contributed to our early troubles at Tilghman Street. It will be found that P. E. Company has reformed oil gas having a ratio of hydrogen to carbon lower than that of propane and nearly as low as that of butane. Item 8 is also to be considered in this connection. There it will be found that the Pure Oil gas sampled on November 17, 1936, contained more carbon per therm than does propane and only slightly less than that contained by butane. The figures shown as cubic feet per therm are of interest since, in reforming we are primarily interested in admitting a certain thermal quantity of hydrocarbon gas to the fire. As the heating value of our oil gas increases, the cubic feet admitted to the fire are decreased. Therefore, this figure shows that the cubic feet of propane and butane to be admitted to the fire would be only about half as great as the cubic feet of oil gas. It is for this reason that the pounds of carbon have been given per therm, rather than per cubic foot of gas. The remainder of the data shown on this table is an attempt to evaluate the performance of the reforming operation with these various hydrocarbon gases. As of 1941, which was the first full year following the increase of the specific gravity of our reformed gas to 0.68, the capacity of one of our reformed gas sets was slightly more than 10,000 M.C.F. per day. On the basis of this operation and the analyses of the various gases listed on the table, computations have been made to show just how the varying analyses of these gases could be expected to affect the operation of the reforming process when manufacturing a street gas of 520 B.t.u. and 0.68 specific gravity. As I have mentioned before, the gas manufactured on the set is of a low specific gravity and has a heating value of from 500 to 600 B.t.u. per cubic foot, so that a considerable amount of blow run gas and enriching oil gas may be utilized to produce the finished street gas of 0.68 specific gravity and 520 B.t.u. For this reason, the specific gravity of the set gas, excluding the blowrun gases, is of interest since the lower this figure, the more blowrun and enriching oil gas may be added. This figure is shown as 0.449 for the 1941 operation, with a maximum for the oil gas operation of 0.457 when using the Pure Oil gas. This figure is higher than the calculated specific gravity of the set gas with propane and only slightly below that with butane, indicating that so far as the characteristics of the set gas are concerned, there would not be a great deal of change in going to these commercial liquefied petroleum gases.

TABLE II Comparison of Operating Cycles When Reforming Refinery Oil Gas and Butane

	I First Cycle Reforming Oil Gas on Mech. Generator Set	II Average Cycle Reforming Oil Gas	III Test Run Reforming Butane
Date	10-29-29	9-16-40	6-16-44
Atmospheric Temperature	-	60°F	77°F
Blow	30	17	21.5
Blow Run	-	15	11.5
Up-Steam	28	5	6.0
Up-Steam & Oil Gas	-	7	8.5
Down-Steam & Oil Gas	34	34	36.0
Down-Steam	2	-	-
Up-Steam & Oil Gas	-	14	8.5
Up-Steam	4	5	5.0
Blast Purge	2	3	3.0
Total	100 = 5 mins.	100 = 4 mins.	100.0 = 4 mins.
Air Rates - CFM			
Blow	13,100	19,700	19,750
Blow Run	-	12,000 (Est'd.)	13,650
Up-Run Rates			
Steam - #/Min.	225	350	300
Steam with Oil Gas - #/Min.	-	200	200
Oil Gas - CFM	-	1,400	800
Down-Run Rates			
Steam - #/Min.	225		
Steam with Oil Gas - #/Min.	200	200	200
Oil Gas - CFM	1,200	1,600	1,100

At the bottom of the table is shown the specific gravity of the mixture of hydrocarbon gas and blowrun which would be added to the set gas to produce the final street gas of 520 B.t.u. and 0.68 specific gravity. Here it will be found that all of the oil gases give a specific gravity appreciably below that obtained with either propane or butane. This means that less of the commercial hydrocarbon gases may be used for cold enriching, and, therefore, that less blowrun may be utilized with them; and it is principally for this reason that the calculated capacity in M.C.F. per day of one of our reformed gas sets is only 9,140 M.C.F. for propane and 8,830 M.C.F. for butane, as contrasted to approximately 10,000 M.C.F. for all the oil gases. There is a slight effect that is now shown in this table which would tend to increase the set capacity with the liquefied petroleum gases and that is when using the smaller amount of blowrun permissible with these gases, it would be possible to reform the hydrocarbon gas for a slightly longer portion of the cycle since part of the blowrun would be replaced by blow, which, with its higher air rate will store the same amount of heat in the fire in a shorter period of time. Allowance for this difference was considered a refinement unnecessary in this table.

The ninth item in the table is the average make per set day which was actually recorded during the month when the oil gas sample in question was taken. The average figure obtained over the month is used to avoid reflecting any unusual condition which might have existed for a single day. This figure is shown simply to indicate the capacity we actually achieved, but it may be said that since 1941 we have been able to obtain substantially 10,000 M.C.F.

TABLE III Composition of Various Types of Gases

TYPE OF CONSTITUENT	STATION "A"		REFORMED OIL GAS AT TILGHMAN ST. PLANT					Carburetted Water Gas	Coke Oven Gas
	Year 1928	Year 1928	9/21/29	9/24/29	2/24/30	3/21/30	1/15/41		
Column No.	1	2	3	4	5	6	7	8	9
Blue Gases--(Fast Burning)									
CO - Carbon Monoxide	14.3%	20.8%	21.6%	20.0%	14.4%	15.1%	15.0%	32.6%	7.0%
H_2 - Hydrogen	50.9	49.8	46.9	47.0	37.5	32.7	20.0	38.2	54.4
Sub Total	65.2	70.6	68.5	67.0	51.9	47.8	35.0	70.8	61.4
Hydrocarbons - (Slow Burning)									
CH_4 - Methane	15.9%	12.3%	17.0%	17.6%	21.2%	22.6%	32.5%	8.0%	25.0%
C_2H_6 - Ethane	5.0	5.5	-	-	-	-	-	2.2	0.5
- - Illuminants	2.4	3.7	5.7	5.1	5.9	6.1	3.6	8.6	2.9
Sub Total	23.3	21.5	22.7	22.7	27.1	28.7	36.1	18.8	28.4
Non Combustible Gas									
CO_2 - Carbon Dioxide	2.2%	2.3%	2.8%	3.0%	5.4%	3.6%	5.7%	3.4%	2.3%
O_2 - Oxygen	0.9	0.7	0.3	0.6	1.1	0.8	0.7	0.5	0.6
N_2 - Nitrogen	8.4	4.9	5.7	6.7	14.5	19.1	22.5	6.5	7.3
Sub Total	11.5	7.9	8.8	10.3	21.0	23.5	28.9	10.4	10.2
TOTAL GAS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Specific Gravity	0.497	0.506	0.473	0.541	0.587	0.628	0.685	0.643	0.402
B.t.u. per cubic foot	530	530	520	520	520	520	521	530	523
Ratio - Fast burning to Slow burning	2.80	3.28	3.02	2.95	1.92	1.67	0.97	3.77	2.16

per day from a set despite the changes in the oil gas that may have occurred, and the lower capacity reflected in the sixth column merely indicates that during the month in question load conditions were such that full set capacity was not required. The same thing is true in the earlier columns where capacities about equal to that in column 1 were obtained whenever load conditions required, although columns 3 and 4 show that during the lower-demand month of April, a lesser capacity was recorded.

As shown in the 12th item, on a theoretical basis, there is little to choose between the oil gases that we have used so far as capacity is concerned.

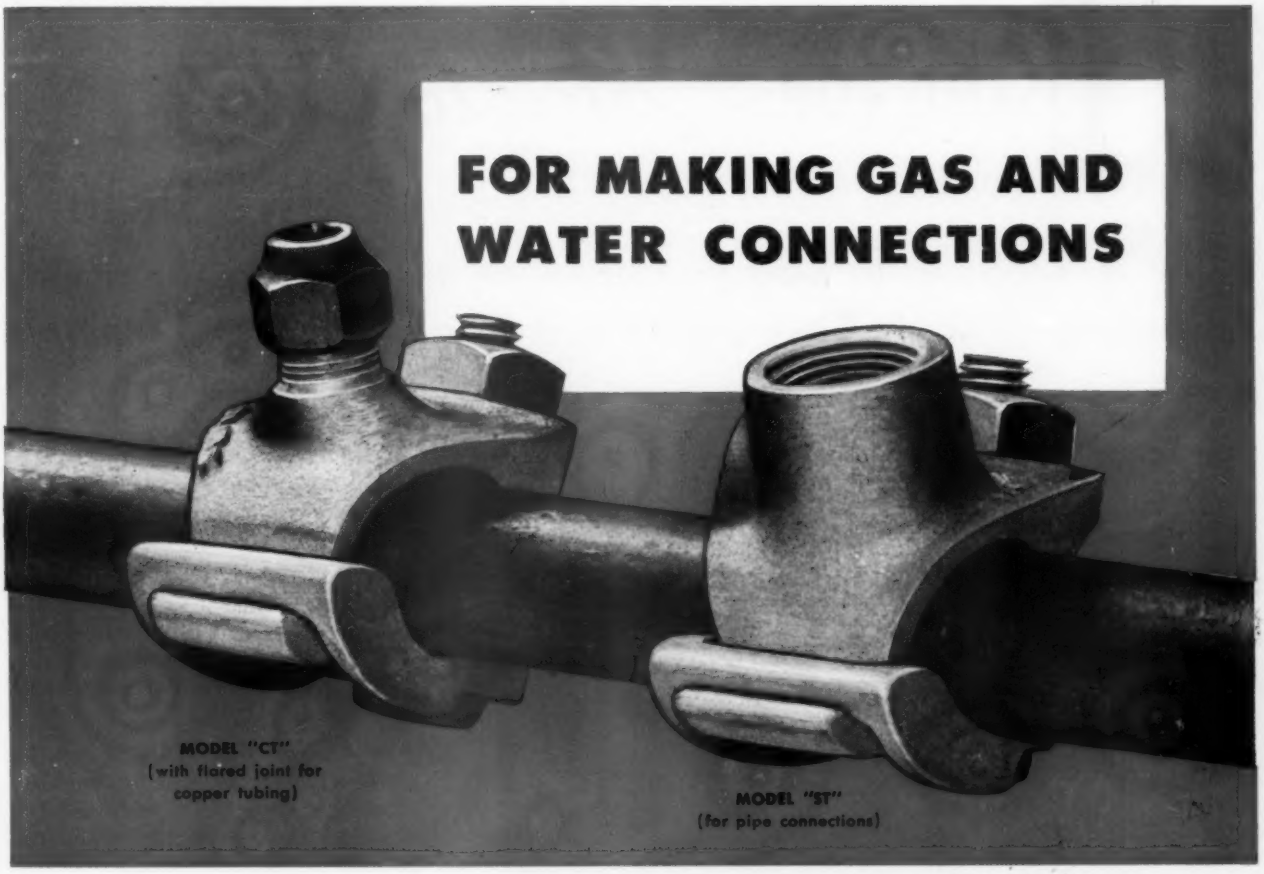
It will be observed that in the last column a capacity of 8,250 M.C.F. per set day is shown, with the statement that this was based on a one-day test run. This test was carried out at our Tilghman Street Plant to check our operation, using this liquefied hydrocarbon gas which could be stored in a liquid form in very much larger thermal quantities than the regular refinery oil gas. During this test regular refinery oil gas was used for cold enriching and for this reason a slightly higher capacity was obtained than would have been possible with butane used for enriching, because of the lower gravity of the oil gas. Despite this fact, it will be noted that this capacity was somewhat below the calculated figure, but it was the belief of the operators that the results experienced during a single one-day operation could probably be bettered if operation were continued long enough to give more familiarity with the use of this gas. Observations made during the test indicate that the heating value and specific gravity of the set gas, excluding the blowrun, compared very closely with calculated figures based on the theoretical considerations as reflected in this table.

Table II compares the cycle used when we first started to reform oil gas in our mechanical generator sets in 1929 with the cycle as used in our present operation as typified in the second column, and further compares our present operation with a one-day test run reforming butane. Comparison of columns 1 and 2 shows why our set capacity has increased. Whereas we reformed oil gas for only 34 percent of the cycle in 1929 at a rate of 1,200 C.F.M., in 1940 we were reforming for 55% of the cycle at a rate of from 1,400 to 1,600 C.F.M. Further, the blow, or non-gas-making part of the cycle, has been reduced from 30 to 17 percent. The first up steam to "temper" the fire has disappeared, replaced by a short steam purge, the "tempering" being done principally by the blow run. Air rates, oil gas rates and steam rates have all risen considerably, reflecting the discarding of the theory of the necessity for limited flow rates to retain the lampblack in the fire and the discovery that deposition of the carbon on the coke surface by surface cracking would permit much higher flow rates.

Comparison of columns 2 and 3 shows the changes made to reform butane. Since we do make slight changes from time to time in our operating, depending upon varying conditions of temporary fire condition, type and size of coke used, atmospheric temperature, etc., operation for a single day reforming butane is not exactly representative but does afford a measure of contrast between the two operations, and shows a cycle that we found satisfactory for at least that length of time.

It will be noticed that the butane reforming covered about 53 percent of the cycle against 55 percent for oil gas. Since the down butane flow rate is proportionally somewhat high, based on a B.t.u. comparison, the amount of reforming is about the same in the two cycles. The length of down run in Column 3 is longer than Column 2, and may have been

(Concluded on page 78)



Approved by Underwriters' Laboratories, Inc.

For making both gas and water connections. Takes place of tee, union, and nipple in one fixture. No pipe cutting or threading necessary. The "cutting in" of ordinary tees is sometimes tremendously difficult. With the SKINNER-SEAL Saddle Tee, the job becomes simple and quick—cutting installation costs materially.

Made of malleable iron, electro-plated. Two styles: Model "ST" with threads at the outlet for pipe connections—also Model "CT" with flared joint for ⅜" O. D. copper tubing.

For installing SERVEL ELECTROLUX Refrigerators, BENDIX Home Laundries, heaters, etc.

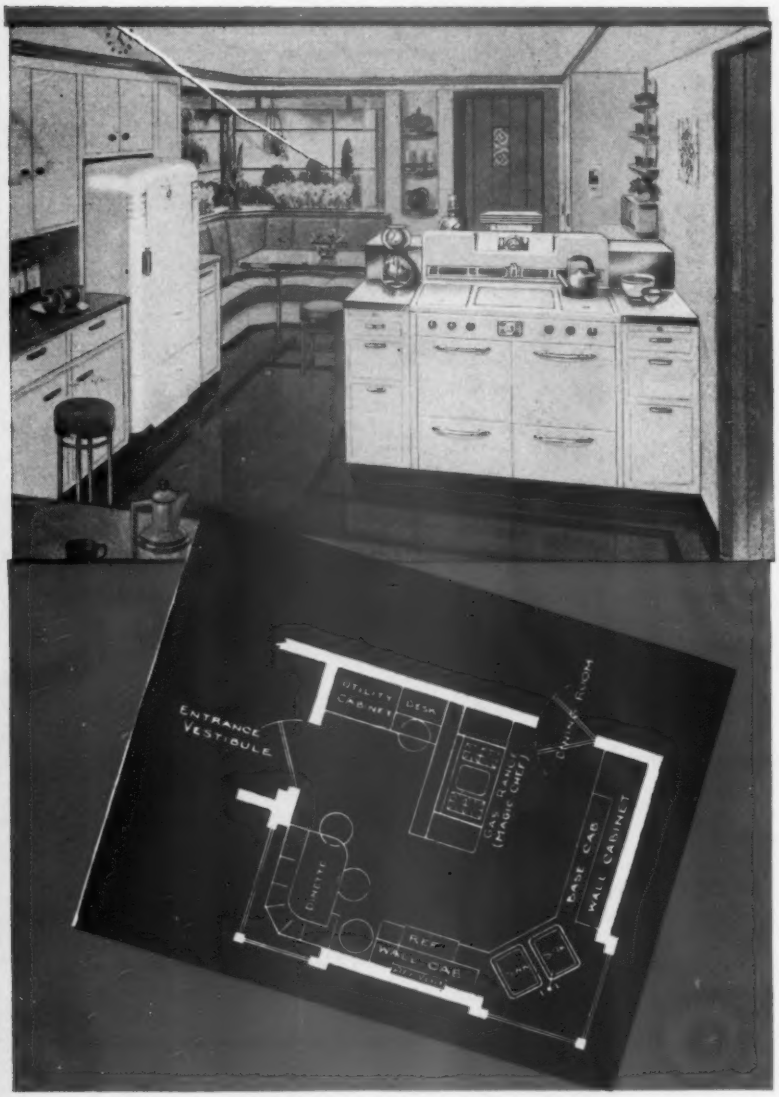
This item was out of production during the war but we have resumed manufacture and invite correspondance concerning your requirements.

M. B. SKINNER COMPANY • SOUTH BEND 21, INDIANA, U. S. A.

SKINNER-SEAL SADDLE TEE

SEND FOR *Magic Chef* KITCHEN PLANNING DATA

. . . It is designed to help you promote the New Freedom Gas Kitchen and Magic Chef gas ranges to architects and builders



THE DATA CONSISTS OF 4 PIECES:

1. **L898 Kitchen Supplement showing 12 different kitchen designs offering a wide variety of arrangements and utility features to choose from.**
2. **L906 Floor Plant Insert—shows the detailed floor plan of each of the 12 kitchens mentioned in Item No. 1 plus detailed plans for other sections of the kitchen.**
3. **L896 Kitchen Broadside shows 10 kitchens in full color which affords excellent opportunity to study the full effects of contrasting colors in the kitchen.**
4. **L895 Magic Chef Specification page. Gives detailed measurements on 5 different models of Magic Chef Gas Ranges.**

This program will afford you an opportunity to contact either personally or by mail the men in your community who will influence the design and construction of kitchens in new homes. This program will give you the opportunity to basically promote the New Freedom Gas Kitchen and Magic Chef, as well as other gas appliances. This data is timely and affords you still another opportunity to tie in with the big Magic Chef national advertising program. For details see your Magic Chef representative or write your nearest American Stove office.

AMERICAN STOVE COMPANY
4301 Perkins Ave. • Cleveland, Ohio
NEW YORK • ATLANTA • PHILADELPHIA • CHICAGO
CLEVELAND • ST. LOUIS • LOS ANGELES

The Symbol of "Certified Performance"

Magic Chef

RED WHEEL GAS RANGES AND HEAVY DUTY GAS COOKING EQUIPMENT

LOOK FOR THE FAMOUS RED WHEEL . . . THE MARK OF DEPENDABILITY

What's Cooking and Who Will Serve It

By
George L. Scofield
New Business Manager
Republic Light Heat & Power Co.
Buffalo, New York.

SALES PROMOTION in our industry has been one of our major problems since gas service was inaugurated on this continent, and it was only through keen salesmanship over a number of years by Gas Companies that Gas was sold to replace kerosene for lighting.

During the latter part of the 19th century when we were confronted with the loss of our base load, gas lighting, it was found necessary, on account of lack of public acceptance of Gas cooking, to popularize our relatively new service.

The Gas industry was the sole party interested at that time in undertaking the job, and it was only our "Goose that was in danger of being cooked." The Gas stove promotion that followed proved to be a very prudent investment as the convenience of Gas cooking was eventually sold to the public, resulting in much larger and more profitable business.

Each major refinement of the Gas range and each new appliance developed had to be pioneered by our Industry. After the original cook stove came the range equipped with insulation and oven heat control; then the table top models; and now the "CP" Cooking Marvel.

Gas water heating was first promoted with tank heaters, and today we are still aggressively furthering the acceptance of automatic Gas hot water storage systems. Much promotion remains to be done on Gas refrigerators, all year round Gas air conditioners, Gas Incinerators, Gas clothes dryers, and numerous commercial and industrial appliances and processes.

Electric Competition

While we are primarily engaged in selling Gas Service, it has been found that we must only promote the sale of Gas appliances that render a complete and highly satisfactory service, thereby securing customer satisfaction necessary for the retention and/or increasing of our revenues. For a considerable time and to a greater extent in recent years, the Electric Industry has been eying and acquiring cooking business until today it serves 15% of the homes in the U. S. A. with electric cookery. It is reported that the Ontario Hydro Commission serves electricity for cooking to approximately 36.3% of the homes in this Province at a low operating cost of approximately $1.00 monthly for the average family.

Since the introduction of the mechanical refrigerator about twenty-five years ago, electric refrigerators have been purchased by about 65% to 75% of the housewives in the States, and in Ontario electric refrigeration saturation is approximately 39%, with operating costs running as low as 30c monthly. Electric water heating in Ontario has gained considerable customer acceptance under a flat rate plan costing the customer $1.48 net monthly for a 600 watt unit, and proportionately more for larger jobs. The saturation of electric water heaters in Ontario is reported as 26.7% of which 13.4% is flat rate installations and 13.3% is metered water heaters.

Our very existence is again seriously threatened by this competition. Can we afford to sit back in this critical period and permit our present investment and present earnings to be impaired by inadequate or improper promotion of our commodity?

The best and most effective work in any field is always done by the one having the most at stake. The individual appliance dealer is engaged in selling many items of merchandise and can generally be expected to sell whatever type of equipment, gas or electric, and at the price which is most agreeable to his customer.

Good promotion of any item, including modern, time saving, and truly convenient gas appliances costs money, and if we are to retain or improve our present position, we must continue that responsibility. Let's take a look at some of the pre-war expenditures for this work:

Replies from a questionnaire sent out to fifteen other very prominent gas and electric companies throughout the entire United States show that 3.86% of their gross gas and/or electric revenues was spent during 1940 for load retention and commodity promotion.

Gas Industry is Now Fortified

In the very early days of gas appliance promotion, the only thought was toward building new load. We had no good weapon with which we could fight our electric competitor when he decided to take the lighting load. Today we are fortunate in the battle for our domestic load in having several effective weapons: the "CP" Gas Range, the automatic Gas water heater, and the Gas refrigerator, each affording a service superior to that rendered by the like electric appliance.

Many leaders of our industry are firmly of the opinion that the "CP" Gas Range is the only Gas Range which is truly modern. Don't we all agree with what Mr. Sorby told us at Murray Bay? i.e.—"Any Gas appliance depending upon a match for ignition is not properly interpreting the modernity of our fuel." We don't endeavor to promote Gas water heaters requiring a match to ignite them every time hot water is needed; our house heating units and refrigerators are completely automatic—then—why should we attempt to meet or defeat our electric competition which is threatening our very existence by selling Gas ranges requiring matches for oven lighting? Surveys indicate that women greatly dislike manual oven lighting. One conducted by the "Woman's Home Companion" shows that 64% desire that convenience. The younger generation of today is afraid to light a gas oven so shouldn't we start out our post war promotion with a sin-

No. of Utilities	*Class of Utility Service*	*% of Gross Gas Revenues Spent* *Low*	*High*	*Average*
8	Electricity	1.6%	3.9%	2.5%
9	Manufactured Gas	1.5%	6.2%	4.4%
7	Natural Gas	0.7%	3.6%	2.8%

cere program built around "CP" models?

Precious time has already been lost by many gas companies on this continent in not promoting "CP" Gas Ranges due to complacency, improper sales promotion or lack of appreciation of the need and possibilities of the "CP" Cooking Marvel. Others have deferred supporting the "CP" Program because the oven and broiler lighter available did not meet with their particular approval.

Let's grant that a "CP" Gas Range equipped with multiple gas ignition uses a trifle more Gas than a range without automatic oven and broiler lighting, and single point ignition, when developed, may use less Gas and will be less costly to install. Even electric ignition may be quite satisfactory to some. Surely those are not the deciding factors as to whether or not we shall promote "CP" Gas Ranges.

Ask yourself this question and answer it truthfully. Is the customer primarily concerned about the type of automatic oven lighting when she replaces her outmoded cook stove with a "CP" Gas Range, or in buying her first Gas range? Isn't the answer—No? Doesn't she want and deserve a completely modern Gas cooking service which only a "CP" model can render?

The companies I represent have approximately four thousand "CP" Gas Ranges installed on their lines in Natural and Manufactured Gas territories, and we can truthfully say that these cooking marvels are rendering a most satisfactory service. We have no high bill squawks or complaints of heat resulting from two to four pilots. We are most certain these "CP" ranges will not be kicked out tomorrow, or at any time, to be replaced by electric ranges. We do feel, however, there is danger of electric ranges replacing gas ranges which require a match to light the oven.

Our policy in New York State, prior to World War II, was to sell nothing but "CP" Gas ranges, and 1126 "CP" ranges (exclusive of dealer sales) were sold during the year 1941 to 41,610 customers. Since that time aggressive promotion has been impossible because of government restrictions and lack of "CP" equipment.

In Ontario our policy was to sell nothing but "CP" Gas Ranges with the exception of three and four-burner under oven models. During 1940, our last year of aggressive promotion, 670 of our 1344 Gas range sales or approximately 50% (exclusive of dealer sales) were "CP" models.

Our results were gained through a determination to sell "CP" Gas Ranges—then making and exercising a plan to do the job. Any Gas company could have done a similarly good job, for as they say—"where there's a will, there's a way." Steps that should be considered are:

(1) Training our employees, salesmen, and dealers to tell a modern cookery story instead of one centered on construction or price.

(2) Sell only "CP" Ranges or at least standardize on "CP" models in the medium and higher priced brackets. Avoid displaying the same model range with and without oven and broiler ignition.

(3) Confine all Gas range advertising to pointing out the many advantages and conveniences of modern Gas cookery with "CP" Gas Ranges.

(4) Give longer terms of payment on "CP" Gas ranges than on non-"CP" models. It's the amount of the monthly payment that's most important—not the selling price.

(5) Pay our salesmen larger commissions or bonuses on "CP" Gas Ranges than on non-"CP" models.

Because of the extensive electric cookery promotion by several large and prominent electric equipment manufacturers, it will be necessary for us to work closer than heretofore with builders and architects to make certain that modern Gas appliances, including "CP" Gas Ranges, are installed in new homes. This is important not only for the large market represented but for the effect the appliances specified for new homes has on the appliances selected for replacement in old homes.

New Freedom Kitchen

Promotion of the New Freedom Gas Kitchen should prove a very effective way to promote modern Gas cookery, as well as silent, trouble-free Gas refrigeration and dependable ever ready Gas hot water service. In this endeavor we should have kitchen experts in our organization who can recommend modern kitchen layouts or completely plan new kitchens for our customers. The Home Service Department should be capable to handle this work.

New Freedom Gas Kitchens will involve cabinets, redecoration, linoleum and even some electric appliances and wiring—such sales might best be made in cooperation with, and placed through, competent dealers, who can assume the entire responsibility for the installations.

Coordinating the dimensions of new Gas ranges with kitchen cabinets is a must for the success of the New Freedom Gas Kitchen Program, and a word from the range manufacturers in this regard should be in order. If they have not given this matter consideration, it should be done immediately.

Many utilities have equipped the Home Economics Department of the schools in their territory with "CP" Gas Ranges. Once or twice yearly representatives of their Home Service Departments give the students of each class a modern cookery story along with care and use instructions on Gas Ranges. Students of today are our customers of tomorrow, and where they have used modern "CP" Gas equipment instead of ancient Gas stoves at school, it has been found that proper consideration is given to Gas cooking equipment when they become home-makers. If our schools are not fully equipped with "CP" Gas Ranges and Gas Refrigerators, we should consider doing so as soon as those appliances and Home Service personnel to demonstrate them are available.

Cooperation With Manufacturers

There should also be closer cooperation between utilities and manufacturers than heretofore, and a plan should be devised or an active committee formed of Manufacturers and Utility Members of the Canadian Gas Association for discussion of our mutual problems. Manufacturers like Gas Companies should be interested in selling more and better Gas appliances on which they and the dealers will make a bigger profit. They should also be interested in standardization of models and their accessories, which will reduce manufacturing, replacement, and serving costs.

Single Point Ignition

Single point Gas ignition, it is reported, is now developed so that it is feasible and positive. If such is the case, it is recommended that an endeavor be made for gas companies and manufacturers to standardize on single point Gas ignition in preference to electric or multi-point Gas ignition. If single point Gas ignition isn't ready, let's accept multi-point ignition for the time being for our immediate promotion.

Experience shows that Gas Ranges equipped with Gas Pressure regulators reduce service calls to a minimum, and consideration should be given to making it standard equipment on all Gas ranges.

"What woman *wills*... will be"

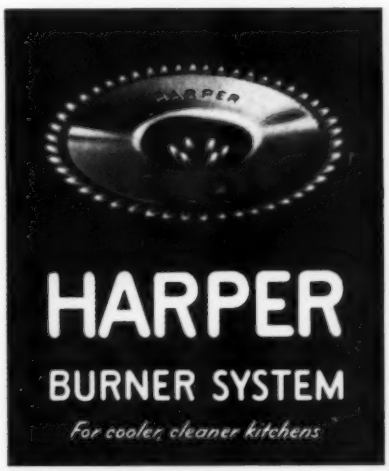
Today she wants aids to cleaner cooking

THE MESSY, inconvenient ice box of yesterday became a back number overnight when women learned about automatic refrigeration. The same thing is happening in the gas range field... women are expressing a clear preference for ranges equipped with the Harper Burner System. And rightly so, because when Harper burners are used, homes stay *cleaner longer* ...excessive steam carrying unpleasant cooking odors and tiny grease particles is eliminated.

The Harper burner performs *double duty*... provides a complete range of heats for frying and to *start* foods boiling, and another separate heat range to *maintain* the cooking and to keep foods warm for serving. Each burner is actually 2 burners in 1... a burner within a burner... both operated by a single handle. The small, inner *cooking* burner can be used entirely independently of the outer *starting* burner. No other top burner possesses this vital advantage, which insures just the right heat for every type of top burner cooking.

Development of the Harper Burner System has done much to convince new and old users that gas is the ideal fuel where the objectives are cooler, cleaner kitchens.

Copr. 1945, Harper-Wyman Co.



On next page
WHAT USERS SAY

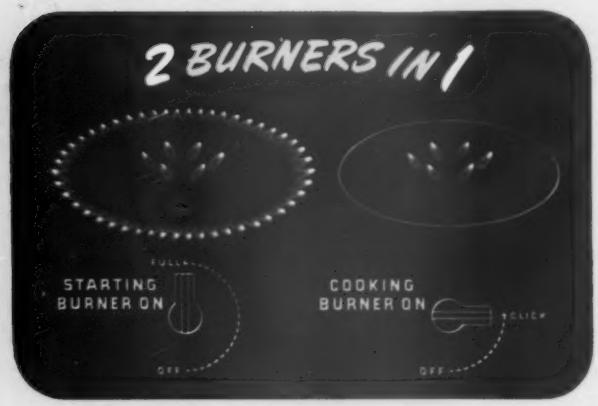
No messy boil-overs with the

HARPER BURNER SYSTEM

says this user

No housewife likes the job of cleaning the range top and flame ports when foods boil over while being cooked. It needn't happen with a Harper equipped range, a feature that appeals to Mrs. Roger DeTrain, 846 E. Haines St., Philadelphia, Pa., who says:

"There is no excuse for food boiling over when you have the Harper Burner System. You don't need to use as much water as with old-fashioned burners, and it is easy to keep the cooking just at the boiling point."



The Harper Burner System operates on the unique principle of "2 burners in 1"... a STARTING BURNER plus a small, economical COOKING BURNER, both controlled by the same handle. It is subject to finer gradations of low heats.

REASON:

(a) Better *control*

(b) Less water needed

ON HARPER BURNER SYSTEM equipped ranges, the flame can be adjusted to much lower levels than is possible with ordinary top burners. It is a simple matter, after the water is quickly brought to a boil with the large STARTING BURNER, to then let the small, economical COOKING BURNER take over and maintain the water just at the boiling point.

Less water is needed, too, because of the wonderful *control* and lower heat levels possible with the Harper Burner System. A single cupful in a covered vessel always takes more than an hour to boil away. A larger flame would only waste fuel and cause boil-overs or boiling dry.

NOTE: A *new* and *improved* Harper Burner System is now available for range manufacturers who are producing deluxe ranges. Harper-Wyman Company, 8562 Vincennes Avenue, Chicago 20, Ill.

HARPER BURNER SYSTEM

"HOLDS THE LINES FOR GAS"

HARPER FLIPNER SYSTEM

—One of the standards of top burner performance under Cp

Filters and Time Control

The matter of pilot filters has been under study by the American Gas Association, and if one is available that will operate satisfactorily on all types of gases, it is recommended that they, too, be made standard equipment on all Gas ranges so as to further improve the service rendered.

Recent redesigning of the automatic clock control for Gas ranges has simplified the construction and reduced the number of its parts materially. It is generally believed there will be a substantial reduction in its cost, and it is quite possible in the not too distant future that it may be a standard "CP" Gas Range requirement. It is also recommended that one particular make of automatic clock control be selected by the Canadian Gas Appliance Manufacturers for stoves produced by them so as to simplify the utility servicing of this accessory.

Even though this simplified clock control may only be furnished as an extra, as we resume our Gas promotion, it should be made immediately available for resale by us and our dealers, as a survey made by the "Woman's Home Companion" shows 76% of the women desire oven clock controls. The promotion of a "CP" automatic Gas Range will permit us to tell a much more modern cookery story than we could present in the past.

Deep Well Cookers

Considerable interest by women has been developed for deep well cookers. The following recommendation made by the Pacific Gas Association seems logical for stoves equipped with only four top burners. . . . "It might be best to supply the deep well cooker as an accessory instead of relinquishing a burner space to install it as a permanent unit. It is also recommended that it be constructed so it can be used as a pressure cooker as well as a non-pressure steamer."

All surveys, including one made by our company in Canada, show that an alarming number of present Gas range users intend to buy electric ranges for their next cooking appliances. The No. 1 reason for this preference is the customer's erroneous belief in the super cleanliness of the electric range. In the opinion of many gas utility leaders, Kitchen Ventilation has great possibilities, and they believe it is an opportunity for us to render a clean and cool cooking service to our customers that can not be approached by electricity.

Kitchen Ventilation

Several different groups in our industry, including the Rochester Gas & Electric Company, Servel, and the American Gas Association have ideas and plans on kitchen ventilation. Which unit will eventually be adopted by the industry still remains a question.

When Kitchen Ventilation is satisfactorily developed, we should include it in our promotion, and manufacturers should immediately incorporate any changes in range design that might be necessary for effective discharge of heat, greases, and products of combustion.

Top Burners

In recent years in obtaining higher top burner efficiencies on Gas Ranges, greater burner sensitivity has been frequently experienced. Gas burners designed for use on Natural Gas would not operate satisfactorily on Manufactured Gas and vice versa. A Gas range cooking top burner was recently tested in one of our Manufactured Gas properties that could be used without pop-backs or service difficulties on Manufactured, Natural, and liquefied petroleum gas. Such improvement in burner operation as standard equipment for Gas ranges would eliminate the necessity of purchasing an entire new set of burners, especially where customers move from the Natural Gas area to a community served by manufactured gas. We may not always be serving natural gas, and gas cooking equipment with top burners of such design might save us, our customers, dealers, and manufacturers considerable money at some future date. It is recommended that earnest consideration be given this matter.

Much progress has been made in the past few years in the ease of appliance servicing, and it should be continued. All valves, accessories, and range parts should be easily accessible for servicing or replacement.

In closing I would like to quote from an article prepared by Hudson W. Reed, President of the Philadelphia Gas Works, which I think hits the nail squarely on the head: "The domestic appliances are our bread and butter, and, if lost, there will be no second defence. I firmly believe that we are masters of our fate; that our future in this business will be whatever we make it. If through lack of courage, initiative, and perseverance, we accept that which we believe to be the inevitable, we will fail. On the other hand, if we will intelligently and aggressively capitalize on our position in the domestic market and promote our product with enthusiasm, we can not help but succeed."

Presented at the Natural Gas Association of Canada, July 20, 1945, at Hamilton, Ontario.

SUPERIOR GAS METERS

For Sound Values and Continuous Operating Economy

Meters for Domestic and Industrial Use. All Sizes 5B to 60C.
Wet Test and Demonstration Meters — Diaphragms —
Service Cleaners — Provers — Meter Repairs

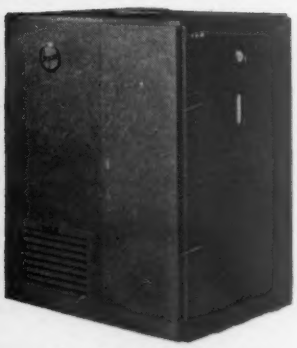
Write for details and quotations

SUPERIOR METER COMPANY, INC.

167 41st Street ***Brooklyn, N. Y.***

Postwar THE Most OF GAS HEATING

Boilers



Forty-two different boilers for steam and hot water heating

All Bryant boilers have CAST IRON sections for long life and efficient operation

Heavy CAST IRON heating element and baffle plates assure maximum heat and long life for the GF-56 model

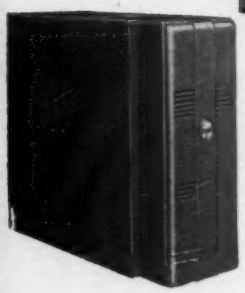
Destined to become popular for small homes heating, this STEEL gravity furnace fits the modest building budget

Gravity Furnaces

Closet space is sufficient room for the VB model with CAST IRON heat exchanger

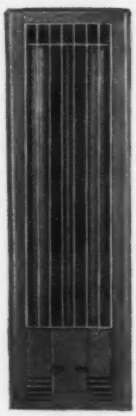
Winter Air Conditioners

CAST IRON heat exchanger also is featured in the BA-88 model



This basement-type model with STEEL heat exchanger provides complete winter air conditioning economically

The Vertical model is a moderately priced, spacesaving unit with STEEL heat exchanger



The new Panelray vented wall heater adds beauty and efficient heating to any room in the house

Bryant wall heaters fill the needs for moderately priced, non-vented installations

New portable space heaters are built in modern streamline designs

Where circulated heat is required, this Console model does the job thoroughly and efficiently

Wall and Space Heaters

Complete Line

EQUIPMENT IN THE NATION!

INCLUDING WATER HEATERS

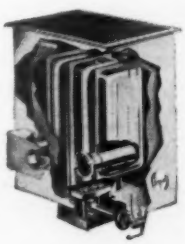
Six new automatic water heaters are included in the Bryant Heater postwar line

The new streamline water heater matches the modern note of many postwar home designs

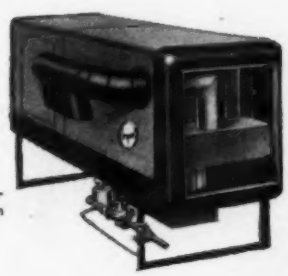
And many specialities

Conversion burners to meet postwar modernization demand

Unit heaters for garages, stores and shops



Floor furnaces in four types to fit every requirement



Forced-air, horizontal space-saver unit for attic installation

• Here it is . . . the postwar gas heating equipment you hoped would come . . . the Bryant Heater line that paves the way for aggressive dealers to go places in the greatest heating market ever opened!

No matter whether your prospect is a new home builder or is modernizing an old home, there is equipment in the improved and expanded Bryant Heater line to fit the job and make a profitable sale.

You can offer boilers with age-resisting cast iron sections, winter air conditioners and gravity furnaces in *both* cast iron and steel heat exchanger models. A group of diversified floor furnaces, wall and space heaters answers small home and individual room heating problems. Specialties, such as conversion burners, attic-installed space-saving heaters and unit heaters complete the picture to meet every heating requirement. All this, plus a new line of Bryant water heaters in a wide range of sizes and prices.

Advertising in national magazines—*more than 13,000,000 four-color printed impressions this year*—has been telling and selling the public on the advantages of buying Bryant Heater equipment, produced by the pioneers of residential gas heating. Colorful new literature and store display materials, as well as an effective radio and newspaper advertising campaign for use in *your own city,* will be ready to help you sell.

Ask the nearest Bryant Heater distributor to give you the complete story, told in the factual presentation, "Postwar Picture of Home Heating." You'll agree with hundreds of other dealers who say . . . *"now's the time to tie up with Bryant!"* Bryant Heater Company, 17825 St. Clair Ave., Cleveland 10, Ohio—One of the Dresser Industries.

bryant
GAS
HEATING

LET THE PUP BE FURNACE MAN

Why it will pay you to recommend...

ACCEPTANCE—American-Standard warm air and radiator heating equipment, well-known and widely advertised for more than half a century, are preferred by home-owners, by builders, by architects— by the majority of all who buy, specify, recommend or install gas-fired heating and domestic hot water equipment.

QUALITY—Back of every product in this famous American-Standard line are research, engineering and manufacturing facilities that are second to none.

SERVICE—American-Standard gas-fired units render long, low-cost service. A fact that has been proved by their many years of outstanding performance.

STYLE—American-Standard products are smartly styled. Their rich eye-appeal means more business for you.

COMPLETE LINE—American-Standard provides one source of supply for a full line of dependable gas-fired heating units, including boilers, warm air furnaces, and domestic hot water heaters.

RESPONSIBILITY—American-Standard products are sold, installed and serviced by reputable and responsible heating and plumbing contractors.

Remember, you're recommending more than gas heating when you suggest products backed by the American-Standard name. You are helping bring health and comfort to the nation's homes. *American Radiator & Standard Sanitary Corporation, P. O. Box 1226, Pittsburgh 30, Pennsylvania.*

AMERICAN-Standard
HEATING PLUMBING
Serving the Nations' Health and Comfort

N. E. G. A. Home Service Development Conference

UNDER the sponsorship of the New England Gas Association, a Home Service Development Conference was held in Boston, September 17th-21st.

The purpose of the Conference was

1. **To equip gas company home service representatives to render the most effective service possible to their customers in this post-war period.**
2. **To present the latest developments covering home service objectives, methods and facilities.**
3. **To stimulate thinking and action towards the application of improved home service procedures.**
4. **To discuss the most effective relationship between home service departments and their communities.**
5. **To discuss the most effective relationship between home service departments and the gas companies as a whole.**
6. **To discuss the sales possibilities of home service work.**
7. **To present material and discussions of interest both to experienced gas company home service representatives and to new ones.**

The Conference was the most substantial undertaking which the NEGA Home Service Group has ever presented to the New England gas industry. Its Purposes and agenda was reviewed and unanimously approved by the Sales Division directors and by the Association directors. It came at a time when many companies are planning to employ additional home service representatives. It presented an unusual opportunity for the prompt and thorough preliminary training of such new representatives—as well as presenting an excellent educational opportunity for home service representatives of considerable experience.

The registrants at the Conference received on the final day a loose-leaf binder containing more than 100 pages of helpful material reproduced by photo-lithography—the summaries of the remarks of most of the 30 speakers and some additional material provided by the NEGA Home Service Development Committee.

Mr. D. S. Reynolds, President of New England Gas Association and Vice-President, Boston Consolidated Gas Company, addressed the Conference on the opening day, Mr. Reynolds said:

"I believe that you Home Service representatives of the New England gas companies face both the greatest opportunities and the greatest responsibilities in your careers.

"There can be no question but that there is a tremendous deferred demand for gas appliances for the simple reason that very few such appliances have been sold for a long time. It would be difficult to imagine such a tremendous backlog of potential gas appliance sales except at the conclusion of the largest war in the world's history during which many kinds of civilian production were completely suspended.

"Another pertinent development is the fact that all about us we see evidence of desires to raise the American standard of living higher than it ever has been, even though it has led the rest of the world. It might well be said that we are in a continuing trend and an apparently accelerated trend toward universally higher living standards in this country. Many forces are working toward this objective. The application of this development to your work is obvious.

"During the war, practically every gas company home service department rendered a variety of customer and community cooperation which demonstrated to many people for the first time the possible value which our home service representatives could be to them. One result is that this development has opened the post-war doors of many people to home service where there may have been lack of information or lack of interest previously. The war performance of many of our home service departments has whetted the appetite of many of our customers in the direction of bigger and better home service performance.

"It seems to me that these 3 developments—the larger deferred appliance demand, the acceleration of the higher living standards movement and the increasingly favorable attitude toward home service because of its war activities—constitute a large and strong foundation upon which you people can build in the post-war period. Not only do these 3 developments exist but our New England gas companies have recognized this fact. For instance, they have helped to make this Conference possible so that you may have the very latest and the very best information for your daily use. New Englnad gas company management recognizes the opportunities and the responsibilities facing their home service departments.

"Nor is the sponsoring of this Conference by the New England gas companies the only evidence of their recognition of the opportunities and responsibilities facing you. A number of gas companies have increased the size of their home service personnel substantially during recent weeks and other companies plan to do likewise shortly. I know of one medium-sized New England gas company which plans to increase the size of its post-war home service department by 500%. Bear in mind that this company had more than one home service representative before the war! Of course, this very substantial expansion which is now in the process of taking place implies and requires increased home service department budgets and expenditures. The home service personnel and budget expansion which I mention would have been considered little short of fantastic as recently as ten years ago.

"As comprehensive an undertaking as this Conference is, it still does not represent all of the proposals covered in your Committee's report. On Friday, each home service representative will receive a package of about 100 pages of material covering this Conference for insertion in the loose-leaf memorandum books which you received this morning. Part of this material will cover in outline form the *NEGA* home service training course, which is also part of the Committee's report and which was prepared at the request of the Sales Division directors. A third part of the report covered the establishment of a New England home service library in Boston. A fourth part of the report covered cooperation with New England educational institutions conducting home economics classes.

"All in all, it is quite apparent that you home service representatives yourselves have also recognized clearly and appropriately the opportunities and responsibilities facing you in the post-war period. In fact, you recognized them more than a year ago when your Committee first asked our gas company managers to indicate their possible interest in the

holding of this Conference. The response of the managers was prompt and encouraging.

"It was pleasing to our gas company executives to see the vision which the NEGA Home Service Group displayed a year ago. It must be equally pleasing to you people to have seen the prompt and wholehearted support which the gas companies gave to your Committee.

"I have presented 3 basic indications of the outstanding opportunities in home service work today. I have outlined the several indications of gas company backing to meet these opportunities. I have shown several ways in which our Association, as such, has recognized the new conditions facing your field of activity. Lastly, I commended the vision of your own Group and the excellent report of your Committee.

"We have here all of the elements of a most successful home service expansion and I know that each of you home service representatives will play a most worthwhile part in this important expansion."

Range Servicing

By

Leo A. Peachey

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Boston Consolidated Gas Company

THE GAS RANGE is designed and manufactured in many types and models, some completely automatic, some semi-automatic, and others manually controlled. Eliminating the controls for the present, a gas range is made up of a variable number of burners for top cooking, one or more ovens and burners for baking, roasting, etc., and a broiling oven and burner. In each instance, the burner is the prime factor and must be designed and placed so that when it is in operation complete combustion will take place at all times.

The word "combustion" was just used and will be used time after time as this meeting progresses so it will be well to define the term and find out what part it plays in relation to the use of gas as gas *alone* will not burn.

Combustion

Combustion—or burning—is a chemical change of matter, usually accompanied by the liberation of heat, or light, or both. This means that, when gas issues from a pipe or burner orifice, it combines with the oxygen in the air. This union raises the temperature of the mixture slightly, but not enough to cause it to light (any chemical reaction either takes up or gives off heat). By applying additional heat—such as a lighted match or any other medium with a sufficiently high temperature—to the air-gas mixture, it is ignited. The heat from the flame thus formed continuously heats the mixture directly in back of the flame to the ignition point thereby producing a constant flame as long as gas issues from the pipe or burner.

When gas is burned in air, the result of this burning is the forming of another gas called the "products of combustion." If the gas is burned in an atmosphere where there is an adequate supply of air, it will burn to Carbon Dioxide (CO_2) which is a harmless gas similar to the gas we exhale each time we take a breath. This is known as "complete combustion."

If there is a deficiency of air in the atmosphere where the gas is burned, it will burn to Carbon Monoxide (CO) which is a toxic gas. This is known as "incomplete combustion." In addition to the need of an adequate supply of air to burn the gas completely, it is necessary that the products formed in the burning be removed from the combustion zone immediately. These products contain no air and, unless removed, will occupy the space of the air required for combustion. This, in effect, places a blanket of non-combustible gas around the flame and causes it to smother out.

The Gas Burner

The Bunsen or blue flame burner is used in all gas ranges in one form or another. The burner is made up of a mixer-head with air shutter, venturi tube, burner body and burner head. Gas enters the burner at the mixer head through an orifice nipple and the velocity of the gas stream entering the burner causes air to be drawn in through the openings in the mixer-head. This air and gas passes through the venturi tube, where it is thoroughly mixed, to the burner body and out through the ports or slots in the burner head where more air is picked up and the gas is completely burned. The air that is drawn in through the mixer-head is known as "primary air" and the air picked up at the point of burning is known as "secondary air."

Burner Adjustment

To adjust a burner, set the air shutter about 1/3 open, turn the orifice in or out until the outer cone is approximately ⅜ inches long. Then reset the air shutter for the proper type and color cone. There are various types and sizes of burners in use but, in every case, the adjustment and operation is as described above.

Burner Inputs

The input on a standard burner is 9000 BTU or 17 cubic feet per hour. On a giant burner, it is 12000 BTU or 22½ c.f.h. Oven and broiler burners have inputs varying from 13000 to 27500 BTU/hour. The input for any particular range may be found on the rating plate.

Simmer Burners

Some top burners are equipped with a turn down or "click" setting which is usually at 2000 BTU/hour. This adjustment is made from a needle valve at the side of the cock. The air and main gas setting should never be altered when making this adjustment.

Other burners are equipped with a separate small burner for the turn-down setting. They are known as "Simmer-save" or "Dual-thrift," etc. This small burner is adjusted in the same way as the standard burner and consumes 1200 BTU/hour. When a range is equipped with this type of burner, the sum of the two inputs make up the normal rating such as 7800 plus 1200 equals 9000 BTU/hour.

Closed-Top Ranges

It was previously said that products of combustion must be exhausted as fast as they were formed. This is comparatively simple on an open-top range because the products will pass up through the grates and out around the cooking pot or kettle.

The closed-top range is another problem, however, because the products cannot pass out through the top. A series of vents or flues is built into the rear of the burner box and a flueway is generally established from each burner to this outlet. This outlet is sized by the manufacturer to take off the products of the gas plus the air needed for combustion

at the rated input with a certain percentage added as a margin of safety. It is very important that a burner in a closed type of range be adjusted to the rated input and not over-gased as over-gasing tends to promote incomplete combustion.

Pilots

A pilot light of some kind is furnished on the majority of gas ranges for lighting the top burners. These may be push-button lighters or flash lighters. An increasing number of gas ranges are being equipped with oven pilots which are generally of the flash type or constant-burning type set close to the burner. Another pilot set-up combines the flash pilot with an automatic safety cut-off valve that shuts off the gas to the entire range in the event of pilot failure.

Heat Controls

There are three general types of heat controls, namely—the rod-and-tube, bi-metal, and liquid-fill controls. There are many variations of each type. When heat is applied to metal, it grows longer due to increased molecular activity. The growing is not confined to the length alone, however. The extent of the increase in length is dependent upon the amount of heat applied. While all metals expand when heated, some expand more than others. Those metals that expand at a fast rate are said to have a high co-efficient of expansion. Those that expand at a slower rate have a low co-efficient. Copper has a high co-efficient and invar steel, porcelain or carbon have a low co-efficient. When metal is allowed to cool to its former temperature, it will contract to its original size.

Liquids also expand when heat is applied and contract when heat is removed. For example, water will expand 1/23 of its volume between the freezing and boiling points. That is, if a vessel containing 23 gallons of water at the freezing point was heated to the boiling point, it would contain 24 gallons of water at that temperature.

Rod-and-Tube Controls

The rod-and-tube heat control is made up of a copper tube closed at one end with a rod inserted in this tube. The rod may be of invar steel, carbon or porcelain—as copper has a high co-efficient of expansion while steel, carbon or porcelain have low co-efficients. The open end of the tube is threaded into a valve body which houses a valve, valve spring and bypass. The valve body has a gasway through it which is closed by the valve. The spring sets in back of the valve, its force being applied toward the valve seats.

Some rod-and-tube controls have compounding levers between the valve and thermal rod to multiply the expansion and open the valve wider allowing the use of a smaller diameter valve but the basic action is as described above on all heat controls.

Bi-metal Controls

A bi-metal type control operates in the same manner as the rod-and-tube control, the only difference being in the thermal member. In place of the rod-and-tube, a bi-metal strip is used to actuate the valve. This strip is composed of two strips of dissimilar metals welded into one. One metal has a high co-efficient of expansion and the other a low co-efficient. When heat is applied, the metal distorts or bends due to one metal expanding faster than the other. When the heat is removed, the metal cools and takes on its original shape. In practice, one end of the metal is securely fastened and the other end is free to actuate the valve directly or indirectly through a series of levers.

Liquid-Fill Controls

Although the basic principle of a liquid-fill heat control is the same as any other type, the design and construction is somewhat different. This control is generally set in the burner box of a range and is subject to temperature variations due to the use of the top burners of the range. To offset this, a compensating device is built into the valve body which acts as a reverse thermal member. This member compensates for burner box temperatures only.

The thermal member for controlling the oven temperatures consists of a diaphragm or bellows attached to or installed in the body of the control. A capillary tube extends from the bellows or diaphragm to the oven proper and a bulb is attached to the end of the tubing. The air is completely withdrawn from this assembly and it is filled with an oil and sealed. When heat is applied, the oil expands extending the bellows or diaphragm which actuates the valve direct or through a leverage system.

All of the above controls have a temperature indicating mechanism built in. The function of this device is to increase or decrease the opening between the valve and its seat, thereby causing the thermal member to expand depending on the selected temperature. The higher the temperature selected, the greater the opening.

Calibrating Controls

There are two generally accepted methods of calibrating modern heat controls—(1) The cold check. (2) The hot check—which is the only accurate method.

To cold check a heat control, one must be certain that both the oven burner and bypass are correctly adjusted and that the oven is at room temperature. It is not feasible to use this method on any control except where the dial is marked with a "CC" or "70" degree line. Turn the dial to any point in the operating range and light the oven burner. Then immediately turn the dial back beyond the CC or 70 mark until the flame cuts down to the lowest possible flame. Then turn the dial in the opposite direction until the flame just starts to increase. This is called the control point and, if the control is properly adjusted, the CC or 70 mark should be opposite the pointer. If not, loosen the dial and set the CC or 70 mark opposite the pointer, taking care not to move the shaft of the control when moving the dial. Tighten dial at this point.

To hot check a control, turn on and light the oven burner making sure that both the main and bypass flames are properly adjusted. Place a thermometer in the centre of the oven, close the door and set the heat control dial to some predetermined temperature, preferably 350°F.

Allow the oven to heat until the flame cuts down, then wait 10 minutes for the oven to come to equilibrium before reading the thermometer. If the thermometer reads lower than the oven setting, loosen the dial and reset at the indicated temperature. If the thermometer reads higher than the dial setting, turn the dial up slowly and observe the oven flame. If the oven flame immediately increases, turn the dial back to its original position, loosen it and reset at the indicated temperature. If the flame does not immediately increase, turn the dial until it does. This is the control point. When the control point is above the original dial setting, it indicates that the bypass flame is too large and should be reset so as to maintain the lower temperatures. No adjustments should be made unless the dial is at the control point or, as it is sometimes called, the "rocking point."

Presented at New England Gas Assn. Home Service Development Conference, Boston, September 18, 1945.

Application of Diethylene Glycol-Water Solution for Dehydration of Natural Gas at 1000 Psig. Pressure

Part 2

By

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Effect of Total Pressure Upon Absorption Rate

In the quantitative study of the variation in rates of absorption, due to increase or decrease of the total pressure in the absorption equipment, it is customary to use the Stefan equation (IX)* (Sherwood):

$$N_a = \frac{DP}{RTx} \ln \frac{Pb_2}{Pb_1}$$

where N_a = rate of diffusion for gas "a" (mols./(unit area) (unit time))

D = diffusion coefficient or diffusivity, cm²/sec.

P = total pressure, atms.

R = gas law constant

T = absolute temperature, °R or °K

x = effective total film thickness

Pb_2 = partial pressure of the inert or non-diffusing gas at outlet, atms.

Pb_1 = partial pressure of the inert or non-diffusing gas at inlet, atms.

The problem of checking the theoretical effect of total pressure on the rate of water vapor absorption by the glycol solution could be stated as follows: by what percentage would the rate of absorption vary while increasing the total operating pressure on the plate tower from 400 psig. to 1000 psig? Using the Stefan equation:

$$\frac{N_a(1000)}{N_a(400)} = \frac{\left[\frac{DP}{RTx}\left(\ln \frac{Pb_2}{Pb_1}\right)\right](1000)}{\left[\frac{DP}{RTx}\left(\ln \frac{Pb_2}{Pb_1}\right)\right](400)} = \frac{\left[\ln \frac{Pb_2}{Pb_1}\right](1000)}{\left[\ln \frac{Pb_2}{Pb_1}\right](400)},$$

because it has been shown that $\frac{DP}{RTx}$ is independent of pressure in absorption processes in which the liquid film resistance becomes negligible and only the gas film resistance plays a controlling part in the rate of diffusion. This simplification of the general equation is permissible because of the high solubility of the water vapor (solute) in the glycol absorbent (solvent) of any concentration.

Using experimental data of the University of Oklahoma Research Institute, "Saturated Water Vapor Content of Natural Gas," the following partial pressures of water vapor and natural gas were computed:

Water vapor content — lbs./M²cf. @ 70°F. dew pt. & 400 psig. = 46.0

Water vapor content — lbs./M²cf. @ 30°F. dew pt. & 400 psig. = 13.4

Water vapor content — lbs./M²cf. @ 70°F. dew pt. & 1000 psig. = 24.5

Water vapor content — lbs./M²cf. @ 30°F. dew pt. & 1000 psig. = 7.6

To calculate Pb_1 and Pb_2 (partial pressures of the natural gas at inlet and outlet of the contractor) we shall calculate their values as shown:

Partial pressure = mol. fraction x total pressure

Mol. fraction gas = 100 minus mol. fraction H_2O

(This equation continued at "B" on following page)

The diffusion rate through the controlling gas films at 1000# is 51.9% of the rate of 400#.

However, taking into consideration the actual quantities of water to be removed from the gas, at 400 psig. and 1000 psig. pressures, one finds that the decrease in diffusion rate is very closely compensated by the lowered weight of the water extracted. The two ratios are found to be as follows:

When operating @ 400 psig. (46.0 — 13.4) = 32.6 lbs. of water are removed per 1 M²cf. of dehydrated gas.

When operating @ 1000 psig. (24.5 — 7.6) = 16.9 lbs. of water are removed per 1 M²cf. of dehydrated gas.

And the ratio of the two weights

$$\frac{16.9 \text{ lbs.}}{32.6 \text{ lbs.}} = .518 \text{ or } 51.8\%.$$

Thus, the decreased rate of diffusion of 51.9% is compensated by the 51.8% drop in the water vapor load, and the performances of absorption equipment at 400 psig. and 1000 psig. should be very nearly identical.

Theoretically, therefore, the increased operating pressure on absorption equipment should not call for any change in the structural design of the absorption equipment details.

Plate Spacing

One serious cause of inefficiency in the bubble cap plate absorber is the entrainment and carry-over of the contacting liquid from the lower plate to the one above. It occurs either as a result of excessive gas velocity through the bubble cap slots, which creates splashing or spouting of the liquid, or due to inadequate plate spacing, which does not allow time for small particles of liquid, suspended in the gas stream, to fall back and settle on the parent plate.

Thus the design of absorption equipment is restricted by two conflicting performance requirements: on the one hand, gas and vapor velocities should be high enough to provide an intimate contact between the liquid and the gaseous phases; and on the other, the contact velocities

* *See Bibliography at end of paper.*

"B" (Continuation of Equation)

For 400# and 70°F. D.P.

$$\frac{46.0\#}{18.016\#} = 2.5533 \text{ mols. of } H_2O \text{ per } M^3cf.$$

$$1\ M^3cf. = \frac{1{,}000{,}000 \times 0.0765 \times 0.650}{18.824} = 2641.575 \text{ mols. of nat. gas}$$

$$\frac{2.5533}{2641.575} \times 100 = .0967\%\ H_2O$$

$$Pb_1 = (1 - .000967) \times \frac{414.73}{14.73} = .999033 \times 28.1554$$

$$= 28.1282 \text{ partial pressure of inlet gas in atmospheres}$$

For 400# and 30°F. D.P.

$$\frac{13.4\#}{18.016\#} = 0.7438 \text{ Mols. } H_2O \text{ per } M^3cf.$$

$$\frac{0.7438}{2641.575} \times 100 = .0282\%\ H_2O$$

$$Pb_2 = (1 - .000282) \times \frac{414.73}{14.73} = .999718 \times 28.1554$$

$$= 28.1475 \text{ partial pressure of outlet gas in atmospheres}$$

For 1000# and 70°F. D.P.

$$\frac{24.5\#}{18.016\#} = 1.3599 \text{ Mols. of } H_2O \text{ per } M^3cf.$$

$$\frac{1.3599}{2641.575} \times 100 = .0515\%\ H_2O$$

$$Pb_1 = (1 - .000515) \times \frac{1014.73}{14.73} = .999485 \times 68.8886$$

$$= 68.8531 \text{ partial pressure of inlet gas in atmospheres}$$

For 1000# and 30°F. D.P.

$$\frac{7.6\#}{18.016\#} = .4218 \text{ Mols. of } H_2O \text{ per } M^3cf.$$

$$\frac{.4218}{2641.575} \times 100 = .0160\%\ H_2O$$

$$Pb_2 = (1 - .000160) \times \frac{1014.73}{14.73} = .999840 \times 68.8886$$

$$= 68.8776 \text{ partial pressure of outlet gas in atmospheres}$$

Then

$$\frac{N_a\,(1000)}{N_a\,(400)} = \frac{\ln \frac{68.8776}{68.8531}}{\ln \frac{28.1475}{28.1282}} = \frac{\text{In } 1.0003558}{\ln 1.0006861} = \frac{15.4517 \times 10^{-5}}{29.7867 \times 10^{-5}}$$

$$= .519 = 51.9\%$$

must not be too high to cause undue entrainment.

Chillas and Weir (XI) report that entrainment is neglibile at a velocity of 2 ft. per second, but that it amounts to 20.5 per cent at 5.5 ft. per second. In typical industrial absorbers, having trays spaced at 22 inches, the entrainment is approximately as shown in Table A on the following page.

Souders and Brown (X) have derived the theoretical suspending velocity and have shown the effect of tray spacing on entrainment. Normally the distance between the plates should never be less than 6 inches above the liquid level for ordinary vapor velocities.

Kallam (IV) finds that the capacity of an absorber was more than doubled by increasing the tray spacing from 7 to 14 inches, and that, at the same time, half as many trays gave almost as good an absorption.

The trays in petroleum oil absorbers are usually spaced at 18 to 24 inches, and in some service the distance is as high as 36 inches.

In our case, we have retained the 36-inch spacing of the 400 psig. absorber in the 1000 psig. vessel, because it provides ample room for the installation of manways through the trays, renders internal inspection of the vessel less difficult, and assures minimum entrainment loss and high plate efficiency.

Determination of the Number of Plates in Absorber

The theoretical calculation of the number of plates needed to achieve a given absorption of one of the components from a complex hydrocarbon mixture usually requires considerable amount of either numerical or graphical computations, because of the fact that each component must be treated separately.

The computation technique for natural gas dehydration, however, is greatly simplified because the process of water vapor absorption involves the removal of only one component from the gaseous phase, namely, water vapor.

Using the method of computation covered by Laulhere and Briscoe (VI), the following number of theoretical plates were found to be needed for the 1000 psig. absorber.

Using the equation:

$$A = \frac{0.00175 G_d}{K} \left(S_w + \frac{18\, S_s}{M_1} \right)$$

TABLE A

Material	*Pressure*	*Linear Velocity Ft. per Sec.*	*Percent Entrainment*
Gasoline	Atmospheric	1.4	0.25
Gasoline	Atmospheric	3.0	0.80
Gas Oil	20 mm.	10.0	1.80
Air Water	Atmospheric	0.3	0.04
Air Water	Atmospheric	2.2	0.70

where A = absorption factor

G = gallons of DEG solution per 1 Mcf. of gas

$$= \frac{10 \text{ gal./min.} \times 60 \times 24}{50{,}000} = 0.288 \text{ gals.}$$

d = specific gravity of the DEG solution (1.117 & 1.115)

S_w = % water by weight of DEG solution (5 & 10%)

S_s = % DEG by weight of DEG solution (95 & 90%)

M_1 = molecular weight of DEG (106.08)

$$K = \frac{y}{x} = k\,P_n/C\,P$$

$$\text{wherein } k = \frac{ab}{Y},$$

b = the ratio of the water vapor content of gas under operating pressure to that at atmospheric pressure for the same temperature.

a = the ratio of water vapor pressure at absorber conditions to that at atmospheric pressure and the same temperature.

Y = superexpansibility factor (1.2125)

k = 1.358 (VI)

P_n = vapor pressure of water at atmospheric pressure and operating temperature (70°F.) = 0.364 lbs. per sq. in. (See Figure 4)

C = hygroscopic absorbent factor for DEG = 1.2 (VI)

P = total operating pressure in psi. abs. = 1014.73 psi. abs.

Evaluating K:

$$K = \frac{1.358 \times 0.364 \text{ psi.}}{1.2 \times 1014.73 \text{ psi.}} = \frac{0.494312}{1217.676} = 0.0004059$$

$$A = \frac{0.00175 \times 0.288 \times 1.116 \text{ (ave. value)}}{0.0004059}\left[\left(\frac{5+10}{2}\right) + \left(\frac{18 \times \frac{90+95}{2}}{106.08}\right)\right]$$

$$= \frac{0.00056246}{0.0004059} \times 23.195 = 1.3857 \times 23.195 = 32.1413$$

From the curves of "Absorption Efficiency vs. Absorption Factor and Number of Theoretical Plates," we find that one theoretical plate will give 97% absorption efficiency, thus requiring at least two theoretically perfect plates per absorber. In general, the plate performance efficiency of an actual plate differs considerably from that of an ideal plate. The actual plate efficiency reportedly ranges from 70 to 90 per cent for petroleum oil columns. Designers of natural gasoline absorbers use a 55 to 65 per cent efficiency figure for low pressure columns and only 45 to 55 per cent for absorbers operating at 400 to 600 psig. pressures.

From these calculations and our own experience with the operation of the 400 psig. absorber, the new 1000 psig. plate tower was designed with four bubble cap plates.

Miscellaneous Detail Design Specifications

The Overflow Pipe capacity is a very important factor in the efficient performance of the bubble cap plate. The capacity of these pipes is limited by the amount of liquid which can enter them, since this flows in under low head. Moreover, the unknown "frothing" coefficient of the DEG-water-natural gasoline solution may affect their capacity to a considerable extent. For these reasons, consideration was given to the careful computation of the required size of overflow pipes.

The designed maximum rate of DEG circulation is equal to 10 gals. per min. With an assumed frothing coefficient of 2:1, the size of the overflow pipe was computed on the basis of 20 gals. per min. volume of "frothed" solution circulation.

The "usually" recommended liquid velocity in these pipes does not exceed 4 linear inches per second. However, since in many vessel designs a velocity of 2 inches per second will not incur a large expense, the use of the low velocity figure was adopted in our absorber. The required number of 3" I.D. and 4" I.D. pipe size spouts for the absorber is determined as in Table B.

The final selection of the shape and the size of overflow pipes was based on the recommendations of engineers representing the pressure vessel manufacturing firm. In adapting their type of bubble caps, risers, and the general plate layout, it was felt that the overflow pipes should be looked upon as an integral part of the bubble cap plate assembly, and consequently the recommended shape would fit in better into their standard type of plate absorber. In the final selection of design, the fabricator of the absorber was requested to provide only the necessary cross-sectional area in the overflow pipe, with no limitation as to the shape of the opening.

TABLE B

$$N_{3''} = \frac{20 \text{ gal./min.} \times 231 \text{ cu. in.}}{60 \text{ sec./min.} \times 2 \text{ in./sec.} \times 7.393 \text{ sq. in.}} = 5.2$$

$$N_{4''} = \frac{20 \text{ gal./min.} \times 231 \text{ cu. in.}}{60 \text{ sec./min.} \times 2 \text{ in./sec.} \times 12.73 \text{ sq. in.}} = 3.0$$

Bubble Caps

The exact design of the bubble cap appears to be of little importance except from the standpoint of convenience in assembling or replacing and also from the cost standpoint. Kallam (III) reports that the shape of the slots appears to have no effect on absorption efficiency. The same shape of bubble is produced with any shape of the slot. At low velocity flat disk-shaped bubbles are produced; at high gas vapor velocity a channeling occurs and a continuous elongated bubble extends through the liquid. Contrary to common belief,

it appears that more effective contacting occurs at low, rather than at high velocities.

The typical dimensional relation between the O.D. of the round caps (in inches), the riser area (in sq. ft.), and the slot area per cap (in sq. ft.) is given in the following table:

Cap O.D. (inches)	Riser Area/Cap (Sq. Ft.)	Slot Area/Cap (Sq. Ft.)
3 — 6	0.0204 — 0.0232	0.0165 — 0.0469

The Overflow Dam

The overflow weir or dam is usually designed so that it maintains 0.5 to 1.5 inches of liquid depth above the top of the bubble cap slots. In general, the plate efficiency is higher with a deep liquid seal. The depth of the seal, however, should be determined by the flow condition. The importance of this fact has been overlooked occasionally in the past and has resulted in the serious loss of DEG solution into the sump, because of inadequate free board distance between the surface of the flowing DEG and the top of the bubble cap riser.

The effective head H above the weir is determined by the formula:

$$Q = 3.33\ (L - 0.2\ H) \times H^{3/2}\ \text{C.F.S.} \quad \text{(XII)}$$

$$Q = 10\ \text{gal./min.} = \frac{10\ \text{gal.}}{\text{Min.} \times 7.48\ \text{gal./cu. ft.}} = \frac{1.34\ \text{cu. ft.}}{\text{Min.}}$$

$$= 0.02233\ \text{cu. ft./sec.}$$

L = Perimeter of the weir = 2.5 ft.

Assuming an arbitrary value for H of ¼ inch (0.0208 ft.) and solving the equation by the trial and error method, it was found that the effective head H of the liquid above the weir is 0.226 inch. Thus, the bubble cap riser should be higher than the height of the downstream weir of the plate by at least ¼ inch, in order to provide the minimum free board distance.

Mist-D-Fiers

The importance of the complete removal of entrained liquid from the gas stream entering the bubble cap absorbers can never be overstressed if one wishes to build as fool-proof a dehydration plant as possible.

To protect the plant against handling excessive amounts of entrained water, well condensate and slugs of absorption oil, some type of scrubbing device should be installed at the base of the absorber.

Highly efficient scrubbing means must also be provided at the outlet of the absorber to thoroughly remove even traces of the DEG solution, because this solution not only is expensive but is just as undesirable in the transmission line as any other type of condensate.

There are several well known manufacturing firms who have specialized in fabrication of scrubbing devices under such names as "Tracy-fier," "Mist-D-Fier," etc., and who are guaranteeing their equipment to limit mechanical entrainment loss from the absorbers to less than 0.075 gallons of DEG per 1 M²cf.

Our experience with the full load operation of "Mist-D-Fier" elements designed for a rate of 30 M²cf. per day at 400 psig. shows entrainment losses of less than .05 gallons per 1 M²cf. On a basis of this experience, "Mist-D-Fier" nests were selected and installed in the 1000 psig. absorber.

Summary

In the discussion given above, the writer has presented an outline of the computations which it was necessary for the designing engineer to go through in order to be able to write up a set of specifications covering important structural details of the water vapor absorption equipment, fabricated to operate at pressures exceeding 1000 psig.

It was felt that methods employed in deriving basic data or in correlating the information already published elsewhere might prove very useful to the operating engineer directly connected with the supervision of dehydration plants.

Attached to the paper are several very useful curves which are available in various publications, but which would be difficult to locate and work into a brief, conveniently assembled form.

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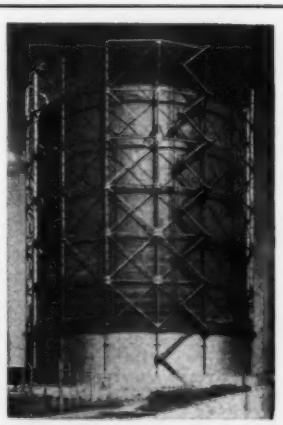

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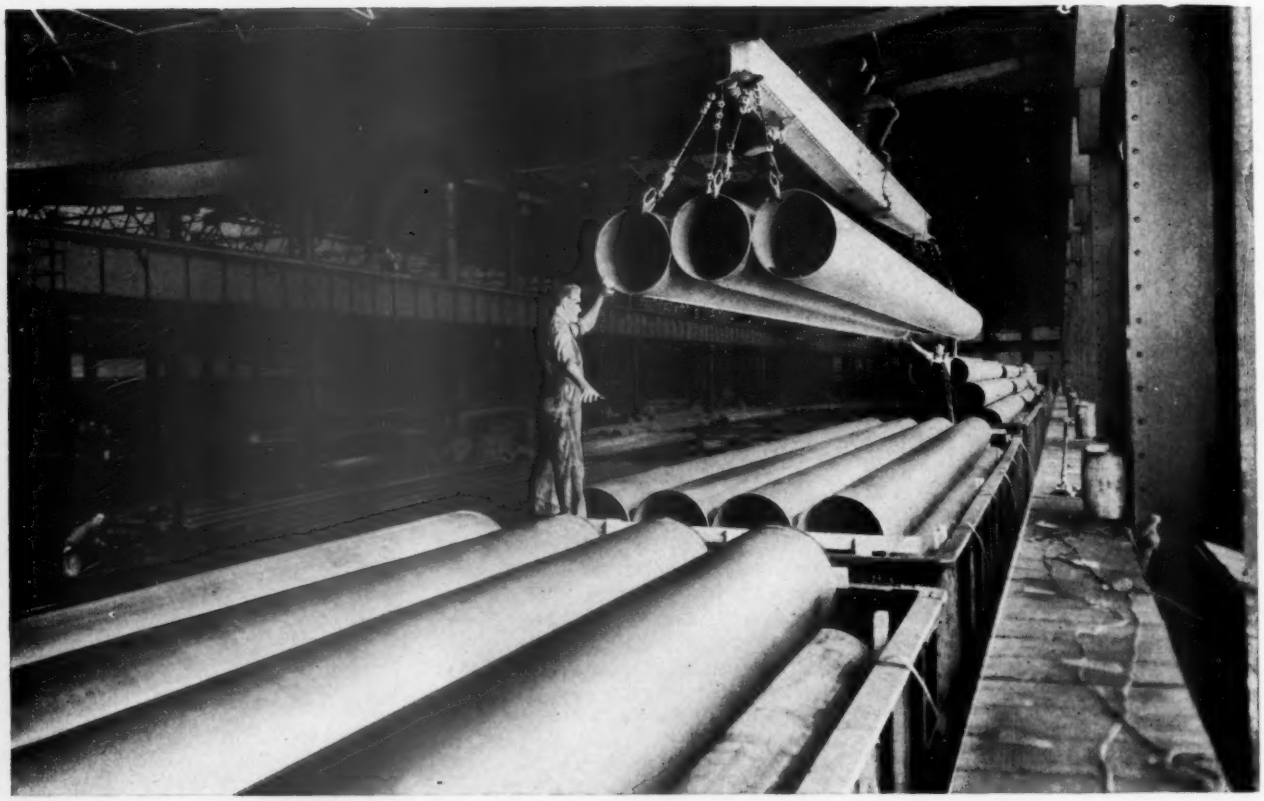

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El Paso Natural Gas Co. Proposes Building 750 Mile Pipe Line

WITH practically all authorities agreeing that Southern California is destined for unprecedented postwar expansion in manufacturing and that residential development will exceed the highest figure of any prewar year, an additional source for supplying the anticipated demands for industrial and domestic gas due to be made on utilities in the southern section of California appeared in prospect late in August.

This development came in the form of the filing with the Federal Power Commission of an application by El Paso Natural Gas Co., El Paso, Tex., for permission to construct a pipeline, as an immediate postwar project, to transmit gas from the Permian Basin natural gas field in Lea County, New Mexico, to a point in Arizona across the Colorado River from Blyth, Calif. The El Paso Co. stated in its application that it hoped to have the line in operation in the spring or summer of 1947.

The application requested permission from the FPC to construct 720 miles of 26-inch diameter pipeline from the Permian Basin oil and dry gas field in the extreme southeastern section of New Mexico for the purpose of transmitting an average of 25 million cubic feet of gas daily to a point on the Colorado River, where it could be connected to a line presumably to be built by Southern California gas companies for carrying the gas to the Los Angeles distribution system.

In addition to the main 26-inch line, El Paso Natural Gas Co. disclosed that its plans involve the construction of 163½ miles of gathering lines, including 117 miles of 24-inch, 32 miles of 18-inch and 14½ miles of 14-inch. The company announced, further, the proposed erection of a compressor station, and a purification and dehydration plant with a capcity of 105,000,000 cu. ft. daily, at Jal, N. M., as part of the general project.

Additional compressor stations spaced along the proposed line would make it possible to deliver up to 300,000,000 cu. ft. per day, as the need for gas develops in California, it was stated.

Gas Sale to California Firms

The overall plan contemplates the sale of Lea County gas to southern California utilities and the construction by them of a pipeline from the Colorado River terminus of the southwestern line to their distributing systems in Los Angeles County.

The application of El Paso Natural Gas Co. set forth that negotiations were underway in August with companies which distribute gas in Southern California with the view of selling New Mexico gas to them at the Colorado River terminus of the pipeline. The Texas utility's petition declared that it is contemplated that the California utilities will build the necessary connecting line.

Although he declared that no formal commitments have been made by Southern California Gas Co. or Southern Counties Gas Co. for purchasing Permian Basin gas, F. S. Wade, president of the Southern Counties Gas Co. of Los Angeles, disclosed that his interests have been approached by El Paso Natural Gas Co. with a proposal to sell natural gas at the western terminus of the proposed line.

While Mr. Wade declined to reveal what decision the Southern California gas concerns had reached in the matter, El Paso Natural Gas Co.'s action in filing the application for construction of the line has been interpreted as indicating that at least informal understanding have been reached.

"Much Interested," Says Wade

"We are very much interested in any sound project which proposes to bring additional natural gas into California at a reasonable cost," Mr. Wade said in a statement issued after disclosure of the Texas Co.'s application had been made. "We ourselves have had under consideration for some time a natural gas pipeline from the great Hugoton and Panhandle fields in Texas to California. During the war, the gas companies in Southern California have been obliged to use the available reserves within the state at an accelerated rate in order to meet the demands of war industries, and thus permit greater release of fuel oil for the armed services.

"Perhaps no other state makes greater use than California of natural gas for its fuel, consuming 15% of the natural gas used in the entire nation. In view of the expected future growth of Southern California we are most interested in any project which offers promise of providing a dependable supply of gas to supplement that obtainable from California fields."

Pointing out that public interest is being served in construction of the line, El Paso Natural Gas Co.'s application stated that ". . . within reach of the gathering lines provided for, there is now being vented to the air approximately the quantity of gas proposed to be initially marketed by Applicant. Under the present rate of drilling this quantity will exceed 150,000,000 cu. ft. in 1947, when this proposed line is to be placed in operation."

Line to Cost $25.4 Million

The El Paso utility estimated the total cost of the line at $25,400,000, with $19,800,000 of that amount to be allocated for the main 26-inch line, $3,400,000 for the gathering lines, and $2,200,00 for auxiliary facilities. Financing, according to the application filed with the Federal Power Commission, would be accomplished through the issuance of $16,700,000 in general bonds, $5,000,000 in preferred stock, and $3,740,000 of bank loans.

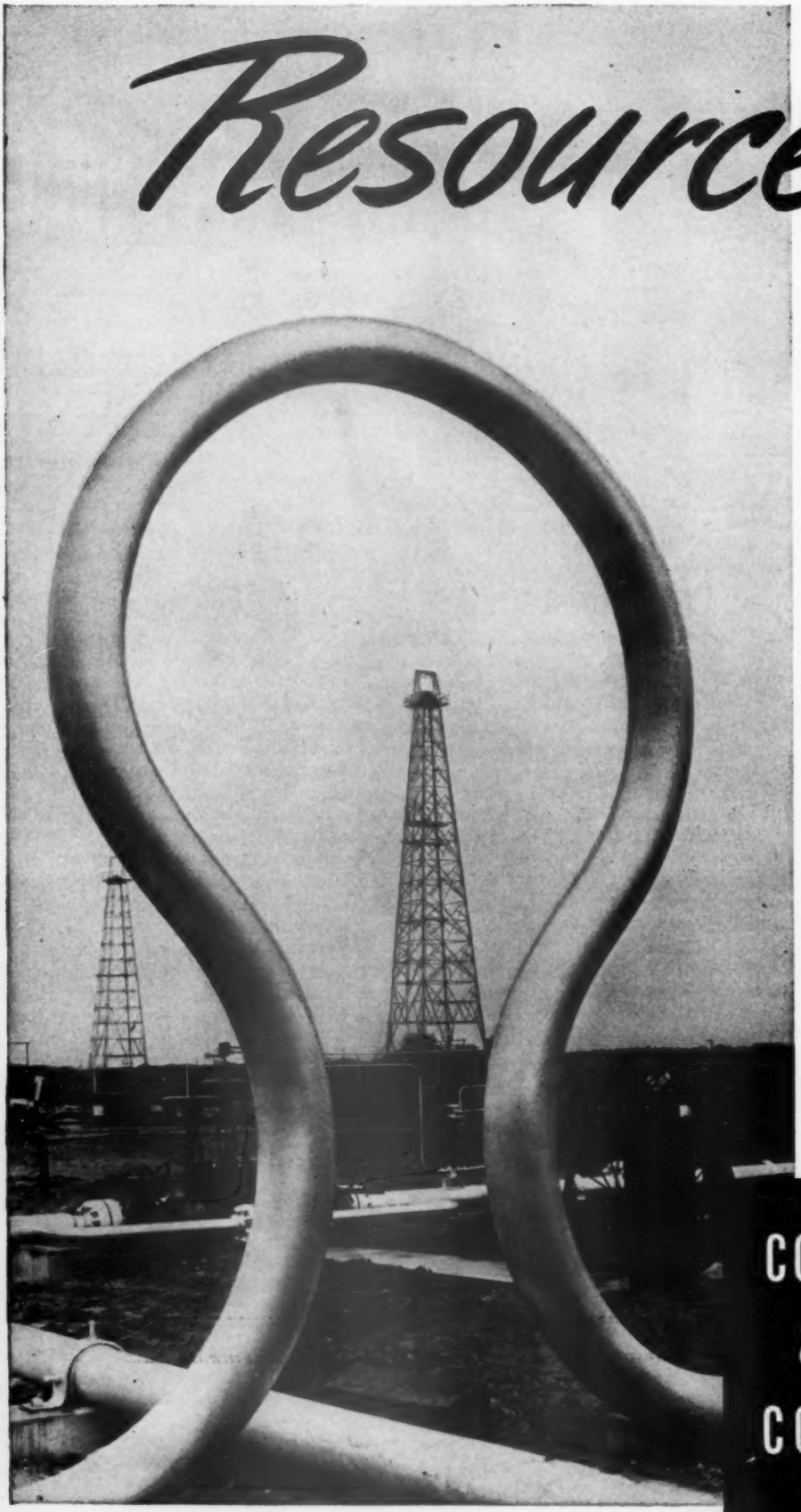
Approximately 210 miles of pipeline would be required to carry the gas from the Colorado River, opposite Blyth, Calif., through Riverside and/or Orange-San Bernardino Counties into Los Angeles County to a connection with the metropolitan distribution systems of Southern California Gas Co. and Southern Counties Gas Co. An estimate of $6,000,000 has been placed, unofficially, on the cost of the connecting line. Since no definite action has as yet been taken by the California utilities, no information on either the route, diameter-size or terminus of the California phase of the project was available as this report was written.

Peterson Appointed Secretary

Promotion of Donald W. Peterson of the Minneapolis Gas Light Co. to the position of secretary and assistant treasurer was announced Sept. 16th, by Harry K. Wrench, president and general manager of the company. He succeeds the late Maurice D. Read who died Sept. 1.

Peterson has been assistant secretary and assistant treasurer the last eight years. He joined the firm 16 years ago as a bookkeeper in the accounting department.

Resources...



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Natural Gas Investigation Hearing Of F. P. C.

THE F.P.C. natural gas investigation started in Kansas City, Mo., Sept. 18th.

At the outset, Commissioner Nelson Lee Smith, presiding, read a statement outlining the Commission's position with respect to the purpose and scope of the hearings. He sought to emphasize that the investigation is purely a fact-finding inquiry for the benefit of the Congress, the Commission, the states and local authorities, the industry as well as its competitors and the general public. He asserted that issues which have been raised in cases which the Commission has heard causes the Commission to feel that it does not now have adequate information to deal effectively with the various contentions, such as end use, the holding of gas in producing areas, and matters generally of broad public policy "some of which appear to go beyond its (the Commission's) authority under the Natural Gas Act."

"It seems clear," Commissioner Smith also stated, "that any administrative agency—which operates as an arm of the legislature in interpreting and applying to specific situations the regulatory policies expressed generally in the statutes under which it functions—should pause from time to time to make certain essential appraisals. This stock-taking should include more than just an inquiry into the effectiveness of its own specific performance; it should involve considerations of the soundness of its interpretations of the legislative expressions of policy and an evaluation of those policies themselves. This, in turn, necessarily must embrace a survey of conditions within the regulated industry as affected by the regulatory policies of the agency and of such conditions and policies—not only upon the owners and customers of the regulated business, but also upon allied or competitive industrial groups—all viewed in the light of the general public interest, which is of paramount importance."

John B. Gage

First witness was Mayor John B. Gage of Kansas City, who offered this proposal: "That the Federal Power Commission, by new legislation, should be authorized in the control of the construction and extension of interstate gas pipelines and the granting of certificates of convenience and necessity to give force and effect on behalf of the federal government to the decisions, rules and regulations of authorities of the state in which the natural gas originates which are designed in the national interest of the end use of the natural gas which the proposed pipeline is to be constructed to transport."

Such legislation, Mayor Gage said, "would involve placing primary responsibility and authority where I believe it should in the first instance rest—that is in the local regulatory authority. It would sweep aside all constitutional objections. The responsibility for conservation would rest primarily with the one most interested — the state conservation agency of the state where the gas was produced."

Andrew Schoeppel

Next witness was Governor Andrew Schoeppel of Kansas, who spoke as chairman of the Interstate Oil Compact Commission. He reviewed the history and accomplishments of the IOCC, and left little doubt that in his opinion the federal government should not be given additional authority over the gas industry.

"Practically every American citizen," he said, "recognizes that whatever can be most efficiently done by the state or local government should not be attempted by the federal government. We think this general principle is accepted by all men, regardless of political affiliation. If the conservation of gas and oil can best be carried out by the states, all will agree that the states should retain such power."

Dr. E. DeGolyer

Dr. E. DeGolyer, nationally known geologist and engineer, was the next witness, being put on the stand by the Natural Gas Industry Committee —the only witness the industry group plans to present during these regional hearings. He declared that the present proven reserves of natural gas in the United States amounts to in excess of 140 trillion cubic feet—enough to last at present rates of production for some 35 years.

B. A. Hardey

The highlight of the testimony was supplied by B. A. Hardey, an independent operator of Shreveport, Louisiana, who presented a resolution adopted by the Oil and Gas Production Committee of the Independent Petroleum Association of America. The resolution stated:

"The regulation and jurisdiction over the production and conservation of natural gas, including gathering, compressing, recycling operations, gasoline plants, sale and delivery of natural gas at the point where interstate commerce commences, is the vested and constitutional right and power of the State and state regulatory bodies in which such is produced, and no jurisdiction in that respect should be conferred upon the Federal Power Commission or other federal agencies. Nor should the Federal Power Commission, or other Federal agencies, seek either to exert or exercise any power or jurisdiction not specifically conferred by law under the Constitution.

"The power and jurisdiction over the end use of gas should not be conferred upon a federal bureau. Competition between fuels should be left to the determination and decision of free competition stripped of the influence of special groups and advantages resulting from attempted administrative control. The policy of the United States in respect to interstate commerce is freedom in competition, and such policy should be maintained and continued.

"The authority for adequate regulations in the public interest governing the production, storage, gathering and handling of natural gas now rests with the States and no federal laws are now either justified, demanded or needed in this respect

"The function of the Federal Government under the constitution is to regulate interstate commerce. Federal agencies should no more assert jurisdiction over oil or gas operations within a state than the state should interfere with the transmission and transportation of natural gas in interstate commerce.

"If and should the Federal Power

Report of Hearing, Sept. 18th to 21st, inclusive.

Commission persist in its attempted control, either directly or indirectly, of the production, processing, gathering and compressing, or the price of gas prior to its sale for resale from the main transportation line in interstate commerce, or in incorporating producing and gathering properties in the rate base for determining rates for transmission in interstate commerce, then either the functions of the Federal Power Commission in respect to the interstate transmission of natural gas should be transferred to the Interstate Commerce Commission now having control of the transportation of other commodities in interstate commerce or otherwise the jurisdiction of the Federal Power Commission should be, by additional legislation, clearly limited to the interstate transportation of gas and the sale of gas in interstate commerce for resale.

"The policy of the Federal Power Commission in attempting to give gas producing and gathering properties a utility status and the valuation of gas producing properties and natural gas on a cost formula is without and beyond the jurisdiction of the Federal Power Commission. The utility principal of regulation is not and cannot be adapted to the gas producing and gathering business and at the same time maintain a healthy industry. The devaluation of gas producing and gathering properties and natural gas in low-cost gas producing areas based upon cost directly tends to encourage waste, destroys the inducement to save gas, and is a positive deterrent and obstacle to gas conservation and good gas producing and gathering practices.

"The Congress of the United States has the sole and exclusive function of legislation with respect to the factors and principles controlling the granting or withholding of certificates. The Federal Power Commission is without power to legislate in these respects by the attempted promulgation of rules, legislative in nature, not prescribed by Congress, for adjudicating the granting or withholding of certificates of convenience and necessity.

"Efforts of the Federal Power Commission to extend, by means of its power to regulate sales of gas for resale in interstate commerce, its jurisdiction to the gas producing and gathering properties of a producer who is not a natural gas company exceed the power vested in the Commission. The conservation, marketing and the prevention of waste of gas will be substantially sided by the removal of such unauthorized threats and attempts either by abandonment of such efforts or by legislative man date.

"That the exercise by the Federal Power Commission, or other Federal agencies of an overlapping or concurrent jurisdiction with that properly vested in the state under their power of sovereignty, results and will result in chaos, confusion, and contradictions which are and will be injurious to the industry, the public, and tend to make inert the effectiveness of both the Federal and state agencies; that both Federal and state agencies should have their respective power or jurisdiction clearly defined so that there will be no interference of the one with the proper functioning of the other."

Mr. Hardey's testimony was challenged by Tom McGrath, counsel for the railroad and coal interests, and George Slaff, chief counsel for the F.P.C. investigating staff. McGrath sought to prove that the coal interests had been granted no special advantages by the F.P.C. and he joined Slaff in protesting any suggestion that the F.P.C. has gone outside of the statutes under which it operates in the actions it has taken. They also attempted to prove that the gas industry, and particularly the general public, has not been injured by actions taken by the F.P.C. However, Mr. Hardey asserted that as a result of F.P.C. actions, which have been upheld by recent court decisions, the fears expressed in the resolution persist in the industry.

Benjamin Miller

Mr. Benjamin Miller, private consultant, gave testimony relative to a survey of plants now actually producing materials from natural gas including synthetic rubber, military material and the Fischer Tropsch synthesis of motor fuel.

During the questioning by attorneys, Mr. Miller said that gas could go to 15c per MCF and still compete with coal for making these products. On the question of transportation, he said that it would be cheaper to establish manufacturing plants near the gas fields and ship the manufactured products for further processing than to pay for the transportation of the gas to distant manufacturing points. He also said that the availability of an adequate labor supply, however, has much to do with dictating the location of the manufacturing plants.

Mr. Miller testified that as long as the price of crude oil stays somewhere near its present level, there will have to be considerable improvement in the Fischer-Tropsch method before it will be commercially feasible to produce gasoline from natural gas at a competitive price. But, he added, if the price of crude oil should substantially advance, or if the reserves of crude oil should play out, "then the situation would be entirely different."

He pointed out that it takes about 10,000 cubic feet of natural gas to produce a barrel of gasoline, thus making the raw material cost extremely low. However, he continued, the labor, equipment and maintenance costs involved in the Fischer-Tropsch method make the cost of production of gasoline considerably higher than the cost of getting gasoline from crude oil.

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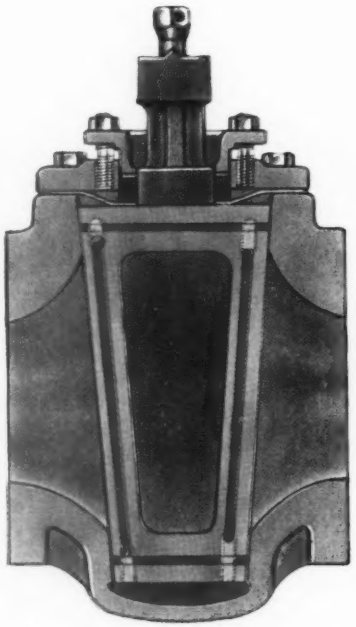

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RECENT COURT DECISIONS
Affecting Gas Utilities

Legal Scope of Workmen's Compensation Laws

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

IT IS GENERALLY recognized that gas company executives and officials have little or no spare time to study complicated higher court decisions, particularly injury controversies involving employes. The new decisions on this subject of law considerably vary the old principles of law. In other words, "hear-say" law of yesterday is unreliable and should be avoided.

In this article we shall review late and leading higher court decisions particularly applicable to "modern" situations and conditions. Thus readers will be assisted to avoid similar law suits, and these new citations may be advantageously used to win unavoidable suits.

Plant Engineer Killed

As above explained all modern higher courts hold that dependents of an employe, killed while performing regular work, may recover compensation. Whether the employe was engaged in "regular" work depends upon the testimony.

For illustration, in Casualty Reciprocal Exchange v. Johnson, 148 Fed. (2d) 228, reported June, 1945, it was shown that a man named Johnson was employed as engineer. One night Johnson, while engaged in employment at the plant, was shot and killed by some unknown person who drove from the street adjacent to the plant. Johnson's wife sued to recover compensation under the State Workmen's Compensation Act.

In holding the wife entitled to compensation the higher court said that an injury may arise in course of employment even though the risk or hazard be external to the employment.

Thus, this court impliedly held that an injury or death arises "out of the employment" while the employe is performing his regular duties, irrespective of the cause of the injury or death.

Scope of Employment

Generally, the ruling of law regarding injuries to gas companies' employes is certainly established, under the laws of all states, that a gas company *never* is liable for an injury sustained by an employe unless the latter was acting within the course or scope of the employment when the injury occurred.

A review of late and leading higher court decisions indicates that an injury does *not* arise "in the course of employment" when it occurs while the employe is on his way to work, and before he has reached the gas company premises, providing the gas company does not furnish transportation. On the other hand, a gas company employe is within the scope of the employment if he sustains an injury while he is traveling upon the gas company premises; or while he is coming from a place maintained by the gas company for the use of the employes, as an incident of the employment; or where the employe is using an automobile or other vehicle furnished by the gas company or bringing property or money or some report or message connected with or pertaining to the company's business; or when a company official controls the actions of the employe.

Therefore, it is quite apparent that a gas company is not liable for payment of compensation for an injury sustained by the employe, except under circumstances where the employe is actually performing an authorized act for the company.

For illustration, in Hantke v. Harris, 54 Pac. 293, the testimony showed that an engineer of a plant was seriously injured while going to work in his own automobile. In holding the gas company not liable, the court said:

"Freytag (employe) was taking a course of his own choosing, had no property of his employer, was on no mission in the interest of his employer, was not in the pay of his employer, and was not subject to the orders of his employer until he arrived at the plant."

On the other hand, see B. & H. Passmore Metal & Roofing Company, Inc., v. New Amsterdam Company, 147 Fed. (2d) 536, reported March, 1945. This litigation involved death of a company's employe who fell off a motor truck while returning to the plant in the company's truck after work. The testimony showed that the employe had, after working all day for the company, *instead of going directly home* from the job, he decided to ride the company's truck to the shop and start from there to his home. Further testimony showed that it was customary for the employes to ride in the truck from the plant to their place of work and back to the plant. The employes were not paid for the time consumed in riding to and from the place of work.

The insurance company refused to pay the insurance to the employe's dependents. However, the higher court held the insurance company fully liable.

Concise Review

In order that readers may with dependability determine under what varied circumstances an employe actually is "in the course of his employment," we shall review several recent higher court cases in which employes were acting "in the course of the employment." These cases are as follows: Robertson v. Olson, 181 Minn. 240, where the employe was returning unused material to his employer in the latter's truck; Elliason v. Western, 202 N. W. 485, the driver was returning to his employer's plant with delivery slips and

money; Caver v. Eggerton, 157 Miss., the hour of employment had passed which was 8 A.M. and the collision occurred at 8:10 A.M. The driver was on his way to the employer's plant to make his first delivery; Schmitt v. American, 42 S. W. (2d) 969, wherein it was the duty of an employe on certain days to leave home earlier than usual and perform work before reporting to the employer's place of business, and the accident happened while the employe was traveling from home to the place where the first work was to be performed; Sales Corp. v. Stayton, 45 F. (2d) 471, where the employe was driving a truck while taking other employes home by the consent and with the authority of employer at time of collision; Kuehmichel, 145 N. W. 788, where the employe was working outside the plant but during the period covered by his employment; Auer, 103 N. J. Law, 372, where the employe was employed to devote his whole time to the service of the company, authorized to use his own automobile, and paid by his employer weekly for the upkeep and running expenses of his car; Employe accidentally shot while attending to work, (109 So. 122); Employe shot by holdup band while attending to work, (134 A. 611); Employe shot while returning from a journey authorized by his employer, (249 Pa. 653); Truck driver injured while walking from his truck to a residence, (153 N. E. 624); Injury received by workman who left his work to get drink of water, (137 N. E. 624); Foreman injured while making things for his own son while in employer's plant, (129 S. E. 667).

Physician Gives Wrong Treatment

Recently, a higher court held that an employer is liable for full and complete payment of compensation for injuries to an employe, irrespective of prior treatments based upon wrong diagnosis.

For example, in Matlock v. International Paper Company, 19 So. (2d) 638, reported January, 1945, it was shown that an employe of a company was injured while performing his regular work. The employe was not informed of his true condition and relying on his employer's doctor advice did light work for two weeks before being forced to quit because of severity of pain.

In subsequent suit the higher court held that the employe was not precluded from recovering compensation under the State Workmen's Compensation Act for complications of the injury which developed finally.

Physicians' Testimony Convinces Court

In all litigations involving injuries to employes, the courts usually rely upon testimony given by responsible physicians.

For example, in Diehl v. General Baking Company, 36 Atl. (2d) 801, reported May, 1944, it was shown that an employe was injured in the course of his employment. He fractured two ribs and subsequently died as result of a rupture of an aneurysm of the aorta.

The higher court awarded his dependents compensation under the State Workmen's Compensation Act because certain physicians testified that the fractured ribs injury aggravated the pre-existing aneurysm and thereby materially contributed to employe's death. This court said:

"A number of well-known medical experts expressed their opinion. . . . All of them conceded that an accidental injury, could cause an aneurysm or a sufficient aggravation of an existing one to materially contribute to his death."

When Employe May Be Examined

Although the state compensation laws require employes to submit to examinations, yet the employe may refuse to take the examination if it is dangerous to his health.

For illustration, in Municipal Gas Company v. Arnold, 105 S. W. (2d) 686, it was disclosed that a state law provides: "When authorized by the board, the Association shall have the privilege of having any injured employe examined by a physician or physicians of its own selection. . . ."

A person employed by the Municipal Gas Company, was injured while working in a ditch one bank of which caved in, causing him to fall with his left foot and leg in the ditch, and his back to "hit the opposite bank" of the ditch. Various injuries to his back, nerves, tendons, tissues, etc., including injuries to his spine, were sustained. Suit was filed to recover compensation under the State Workmen's Compensation Act for total temporary incapacity to labor; and total temporary and partial permanent incapacity to labor.

It was contended that the employe's disability was the result of a disease that he had contracted several years previously. The Industrial Commission demanded that he submit to an examination before three physicians to determine whether his disability resulted from this prior disease. The employe refused to do so, and the higher court held him entitled to $2,912 without submitting to the examination, saying:

"Regardless of what rule obtains with reference to the trial court, certainly it cannot be maintained that any statute or rule of law will compel a plaintiff (employe), at the behest of a defendant (commission) to submit himself to a test that might be attended with 'grave danger to his physical being.' One of the medical witnesses testified that it would not be safe to appellee's (employe's) physical welfare to submit to the withdrawal of fluid from his spinal column, for the purpose of making the Wassermann test."

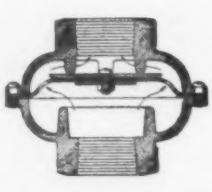
Court Favors Injured Employe

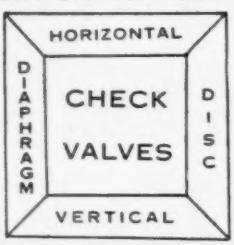
Frequently ,a higher court will not consider an "appeal" involving compensation payable to an injured employe. This is so because the courts are in favor of granting reasonable compensation allowances to injured employes, when it is consistently possible to do so.

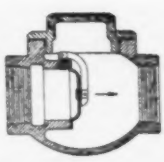
For illustration, in Maloney v. Utility Company, 60 N. E. (2d) 127, reported February, 1945, suit was filed by an employe to recover compensation for an injury. The testimony proved that previously the employe had sustained a similar injury.

The question presented the court

Pressure Controls for Gas and Air







NORWALK VALVE COMPANY
35 Railroad Ave. South Norwalk, Conn.

was whether the employe had fully recovered from the first accident and whether its effects contributed to the second accident.

Although the evidence was not conclusive as to whether the first injury contributed to the second accident, the lower court granted the employe *full* compensation, although the employe still suffered ill effects of the first injury.

The higher court approved the verdict and refused to listen to an appeal made by the employer, on the ground that no one could positively say, as matter of law, that the award in favor of the employe was wholly unsupported by the evidence.

Must Send Notification

Notwithstanding the fact that usually the courts favor injured employes, yet an employe who is injured and fails to promptly notify his employer of such injury is *not* entitled to receive payment of compensation under the State Workmen's Compensation Act.

For example, in Mayo v. Chesapeake Company, 31 S. E. (2d) 574, reported November, 1944, the testimony proved that an employe slightly injured his ankle. He failed to give timely notice as required by a state law to his employer of the injury. Later when the injury developed into a serious condition he notified his employer and sought medical attention. The employe died and his widow sued to recover compensation.

The higher court refused to allow compensation to the widow, saying:

"It is apparent that the Industrial Commission was justified in its holding that no reasonable excuse has been made for the failure to give the required notice."

Also, see Hickman v. Dunlop Company, 185 S. W. (2d) 874, reported March, 1945, where an employe filed suit under the Workmen's Compensation Act to recover compensation for injuries.

A state law provides that claims for injuries must be filed within six months after occurrence of the injury.

During the trial testimony was given that while at his regular work, over a period of several years, the employe handled batteries and on several occasions he got battery water in cuts on his hands. About a year after he began working he noticed small growths or nodules appearing on his hands. They did not cause any discomfort, and were not disabling and he continued doing his work. Later the sores became permanent.

However, since the employe's claim was not filed until more than six months after the sores appeared, the higher court refused to allow compensation. This court said:

"Under the facts the claim should have been filed within six months after it became reasonably discoverable and apparent that an injury resulted from the accident or accidents for which the employe is entitled to compensation."

Also, in Young v. Industrial Accident Commission, 146 Pac. (2d) 693, reported April, 1944, it was shown that an employe was seriously injured while he was using a solution of caustic soda and trilite. The higher court refused to award compensation for injury because the employe did not promptly file his claim.

Miss C. Brubaker Appointed Home Service Director

Miss Charlotte Brubaker has been appointed director of the home service department of the St. Augustine Gas Co. Miss Brubaker is a native of St. Augustine, and received her B.S. degree from Florida State College for Women, where she majored in home economics.

E. L. PAYNE, *President*

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For three years, we've concentrated on war production. But now, reconversion! . . . in limited volume at first, increasing as available materials permit. ★ Continuing under the same management, but better-equipped in every respect . . . we reaffirm our 30-year standards of design, quality and performance. PAYNE Furnaces will continue to meet the highest expectations of gas companies, dealers and the public.

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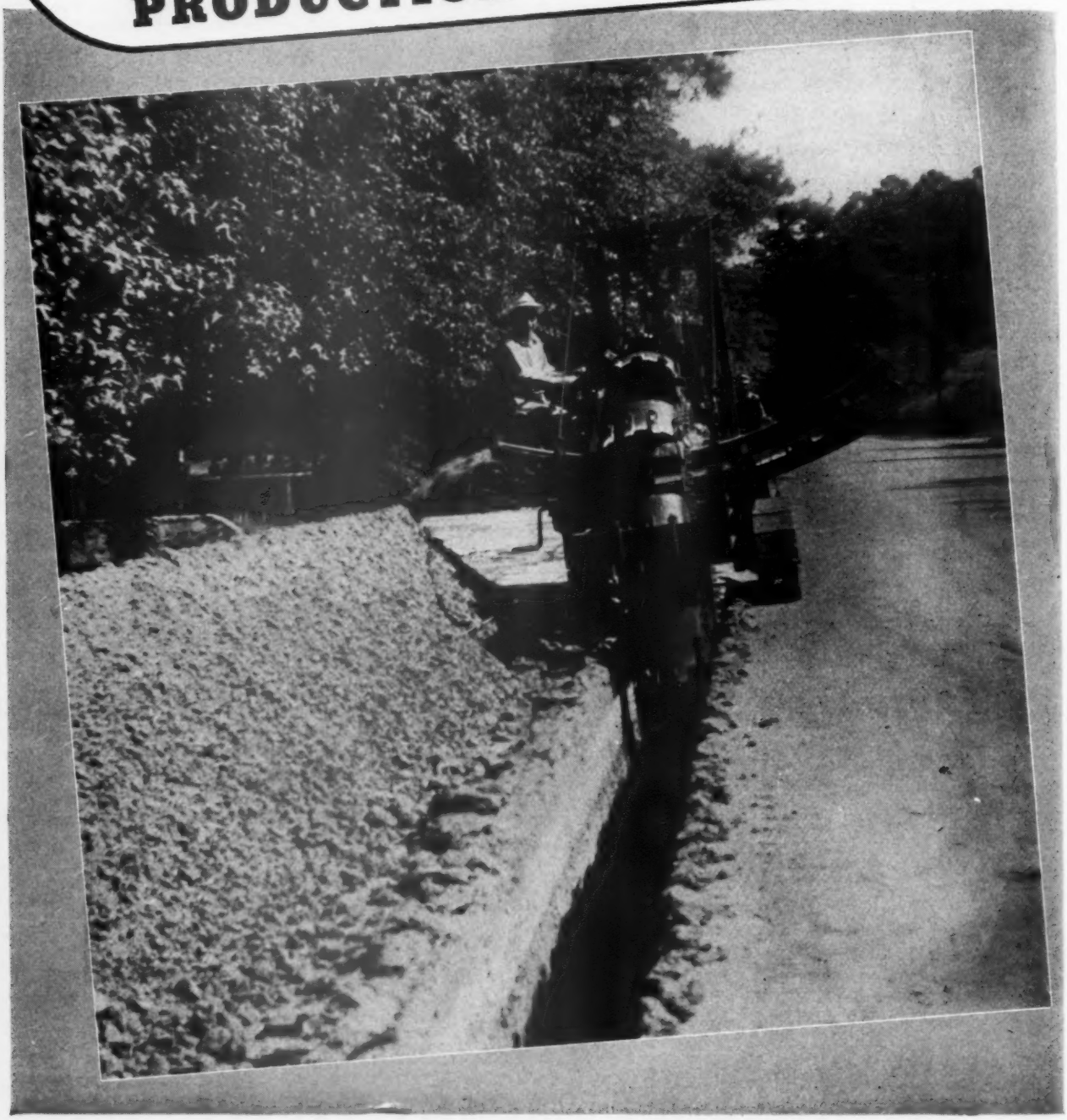

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Abstracted Articles of Current Interest to the Industry

The American Gas Journal inaugurates herewith a new department wherein each month articles of current interest to the industry are abstracted from a group of selected national trade magazines.

This department will be edited by a professional engineer of long standing in the gas utilization and equipment fields.

Some articles of current interest to the industry will be abstracted in considerable detail where the subject matter appears to merit such treatment. Others are touched on briefly, each however having a reference made to the original magazines with the date and page numbers, so that more detailed information can be had whenever required.

This new department brings you authoritative information and news about the industry from many different sources, which would require much laborious reading on the part of an individual if it were not received in this abstracted form. Among the magazines to be reviewed are:

Chemical & Metallurgical Engineering.
Product Engineering.
Industrial Engineering.
Iron Age.
Metals & Alloys.
Industrial Finishing.
American Chemical Society Journal.
Plastics World.
Automotive Industry.
Foundry.
Business Week.
Heating & Ventilating.
Gas Times (London)
The Gas World. (London)
Gas Journal (London)

We will endeavor to keep you well posted through these abstracts, uncovering material which will be of interest to all the industry, whether you are in the natural or manufactured field; industrial, domestic or commercial sections or whether you are an engineer or a salesman.

Corrosion Research Project

Chemical and Engineering News. Vol. 23 No. 13 July 10 1945. pp. 1160-1161.

At Kure Beach, N. C., long term research is going on in metal corrosion in sea water from chemical action, galvanic current, and from marine organisms. Many alloys and protective finishes are being tested under exacting conditions. The strongly corrosive action encountered at the atmospheric testing station was withstood successfully, by specimens of stainless steel, particularly where chromium and nickel contents ran high; by aluminum nickel and magnesium alloys. Ordinary carbon steels and iron fared the worst, especially when copper content was as small as 0.004%.

Natural Gas Used in Making Calcium Carbide

Science News Letter, July 28, 1945 p. 57.

A new method for making calcium carbide in which crushed limestone is combined with natural gas instead of with crushed coke as in present practice has been patented by two chemists of Dallas, Texas, DCS. A. J. Abrams and L. B. Cook. Calcium carbide is one of the most important industrial materials, it being the most convenient source of acetylene used in welding torches, portable lamps, etc.

In the new method, crushed limestone is heated in an electrical induction furnace to a temperature of about 1,000°C, while natural gas containing high percentage of methane is flowed through it. A second heating at a higher temperature, in the neighborhood of 1,700°C, completes the conversion into calcium carbide. The new method, the inventors point out, permits the manufacture of calcium carbide in regions where coke is not available cheaply, and also provides a good economic use for methane, which has long been a chemical waif among the more easily utilizable, large hydro-carbon molecules that make up the mixture known as natural gas.

Infra-red Finish Drying Speeded with Gas

Canadian Paint & Varnish magazine, July 15, 1945, Pages 40 & 84.

Articles describe baking ovens equipped with gas infra-red burners with data showing cuts in finish baking and drying times from hours to minutes.

In one conveyor burners are placed in top and bottom with drying time reduction from 30 minutes in previous steam heated ovens at 400°F. to 3 or 4 minutes same temperature with gas infra-red heating. Another case is shown with job done in 20 minutes instead of 3 to 4 hours with 300% increase in production.

Aids to Limiting Heat Losses and to Ascertaining the Efficiency of Gas Fired Industrial Furnaces

(R. Ehrhardt, Gas, 1942, 14, 127-32)

The heat losses may be calculated from the radiation from the furnace walls, but better from the thermal conductivity of the furnace walls. The ascertained values for furnace walls of various thicknesses and composition, in equilibrium with the furnace interior and external conditions, are rendered diagrammatically; these should serve to facilitate the calculations required by furnace designers and operators. The calculation of the heat flow, during the heating up and cooling down, is more difficult. The best values are generally obtained with the aid of thermal insulation, which should be used more than has been usual practice hitherto. To acertain and prevent external heat flow is the most important feature of furnace design.

Increasing Production with Gas Fusion Welding

(H. Schulz, Zeit. Verein deutsch, Engenieure, 1942, 86, 369-371)

Fusion welding by gas is overwhelmingly carried out by manual operation; to cut down the man-hours necessary for the operation skilled engineering supervision is necessary. For sheet thickness of more than 3 mm. on the average the right hand system of welding gives a 30 percent greater production than the more usual left hand method of welding; in the case of large sheet thickness, cold welds are avoided. Two operators welding, with preheating of the edges, will give increased production for thickness of 3 to 10 mm. It is necessary to install both processes under the supervision of specially trained welders, who will serve to train the welding personnel. For vertical welding, the method of welding simultaneously from both sides will save half of the gas mixture. Machine welding justifies itself for thin sheets, 0.5 to 5 mm. in thickness, for the construction of storage vessel shells, and for seamed tubes and pipes, without the use of welding rod. Also in the case of the light metals, good tubes are also produced with machine welding. The welding of zinc sheets requires careful and somewhat troublesome preparation of the welding edges. Tubes of about 140 mm. diameter and 6 mm. wall thickness are produced on welding machines, designed so that the work moves and the burners are fixed and on such machines particularly high productive rates are obtained.

Will That New Product Click?

Modern Industry, June 15, 1945.

Here are outlined 10 methods currently employed alone or in combination by successful companies for answering above question:

1. Employees as Guinea Pigs.
2. Making Researchers out of Salesmen.
3. Making Dealers and Jobbers Sounding Boards.
4. Putting Stockholders to Work.
5. Getting Advice from Professionals.
6. Utilizing Department Stores, their Buyers and Customers.
7. Testing through Consumer Panels.
8. Keeping Posted through Mail Surveys.
9. Interviewing the People.
10. Having Experts do the Quizzing.

Synthesis of Gasoline and Oil from Natural Gas

Business Week Pgs. 74-77 July 21, 1945, by Hydrocarbon Research, Inc.

The synthesis of gasoline and oil from natural gas is generally based on transformation of the gas into CO and H_2 and the synthesis of these in presence of a catalyst into the various hydrocarbons that are the desired end products.

Natural gas, of course, is a mixture of methane, ethane, propane and other chemically differentiated gases, each composed (in varying amounts) of carbon and hydrogen. Chemists have long known how to break these down into CO and H_2 through the use of steam, CO_2 O_2 or combination of these three.

CO and H_2 when mixed in proportion of one part of former to two of latter become so-called "synthetic gas" from which end products can range from high quality gasoline to diesel oil and paraffin wax depending upon condition prevailing in the controlled reaction zones.

Gases for Heat-Treating

Machinery, March, 1945

***Lean Endogas* or partially reacted or cracked fuel gas used for:**

1. Sintering and powder metallurgy.
2. Short-cycle hardening on med-carb. steels at med-range temperature with no decarburization.
3. Furnace brazing of ferrous metals (except stainless steel).

***Rich Endogas* or completely reacted fuel gas**

1. Bright annealing of high-carbon and alloy-carbon steels without oxidation or decarburization.
2. An efficient carrier for gas carburization.
3. Brazing of ferrous metals especially with high carbon content.

***Lean Exogas* or completely burned fuel gas.**

1. Bright annealing of copper.
2. Clean annealing of brass.
3. Purging enclosure containing explosives or combustible gases.
4. High nitrogen atmospheres.
5. Protective atmospheres for tempering and hardening.
6. Furnace brazing of non-ferrous materials.

***Rich Exogas* or partially burned fuel gas.**

1. Bright annealing and tempering of ferrous metals when decarburization not a factor.
2. Copper brazing ferrous metals (except stainless steel).
3. Brazing of non-ferrous alloys at low, medium and high temperatures.
4. Powder metallurgy where reducing action is not extremely high.

***Lean Monogas* is lean Exogas with Carbon Dioxide and water removed**

1. Bright hardening and annealing of all grades of carbon and alloy-carbon steels.
2. Annealing and hardening of high speed tool steels.

***Rich Monogas* is rich Exogas with carbon dioxide and water removed**

1. Annealing carbon and alloy-carbon steels.

2. Brazing high-carbon and alloy-carbon steels without decarburization.
3. Long annealing cycles where oxidizing impurities cannot enter the furnace.

***Ammogas* is dissociated ammonia**

1. Bright annealing stainless steels.
2. Bright hardening of high-carbon and high-chromium tool steels.
3. Bright annealing of high-carbon steels without decarburization.

Dust Control Equipment

Hydrostatic precipitation, air is cleaned by combination of centrifugal force and inter-mixing of water and dust-laden air. High collection efficiency is claimed as result of impingement of dust in water because of centrifugal action of impeller and scrubbing action of the water curtain sizes 1000 to 25,000 C.F.M. *Factory Management & Maintenance, April 1945.*

Better Layouts Quicker with Scale Models

Complete system of three dimension plant planning and layout using scale models. *Factory Management & Maintenance, April 1945.*

Cost of Maintaining Plant Buildings

Table showing such items as grounds, heating systems, exterior walls, interior walls, roofs, flooring, lighting, sewers and interior supports. *Factory Management & Maintenance, April 1945.*

Vitreous Enameling Simplified

Use of titanium steel has following advantages where recommended nickel flashing, pickling and enameling has been followed:

1. Elimination of enamel boiling due to steel defects.
2. Elimination of conventional ground coat
3. Elimination of copper heading.
4. Improved sag resistance.
5. Improved resistance to warping.
6. Excellent deep drawing qualities.
7. Use of conventional cover coats directly on metal.
8. Resistance to Hydrogen penetration or absorption.

Titanium Steel

Air Conditioning, Heating and Ventilating

Heating & Ventilating, v. 42. pp. 90-95, July, 1945. Vanderweil, R. G.
Based on exhaustive analysis of a large number of actually installed radiant heating systems and laboratory test panels, the author has derived a panel heating theory and developed practical design charts.

Met-Vickers Gazette, v. 21, pp. 61-68, Apr., 1945. King, A. J.
The reduction of noise from air-conditioning systems.

Heating & Ventilating, v. 42, pp. 67-82, July, 1945. Babcock, L. R.
Fuel oil for heating and steam generation.

Heating, Piping & Air Cond., v. 17, pp. 385-388, July, 1945. Mosher, H. A.
When is complete air-conditioning of the modern factory advisable?

Electrician, v. 134, pp. 557-559, June 22, 1945.
Heating by refrigeration. A review of its possible applications.

Engg. News-Record, v. 135, pp. 119, July 12, 1945. Reagan, C. S.
Economical sizes of water pipe.

Heating & Ventilating, v. 42, pp. 85-88, July, 1945.
Atmospheric pollution due to dust and cinders.

Chemistry

Automotive Ind., v. 93, pp. 44, July 1, 1945.
Nox-Rust Tube Coating prevents tube rust in transport or storage, does not run off and dries into a firm, dust-free film.

Chem. & Engg. News, v. 23, pp. 1160-1163, July 10, 1945. Stenerson, H. W.
Corrosion research project at Kure Beach test station. At Kure Beach, near Wilmington, N. C., metals, alloys, and finishes are taking a form of punishment which scientific ingenuity could hardly simulate in any man-made laboratory.

Am. Paint Jl., v. 29, pp. 43, 46-47, 50, July 9, 1945. Mann, L. C.
Post-war finishes for light metal transportation equipment.

Air drying by activated alumina. Engg., v. 159, pp. 517-518, June 29, 1945.

Sci. News Letter, v. 48, pp. 57, July 28, 1945.
Natural gas is used in making calcium carbide.

Business Week, pp. 74-75, 77, July 21, 1945.
Hydrocarbon Research, Inc., has plans for commercial plant to produce synthetic gasoline from natural gas.

Roy. Soc. Lond., Proc., v. 183, pp. 374-388, June 18, 1945. Gaydon, A. G. and Penney, W. G.
The dissociation energies of CO, N_2, NO and CN. Bibliography.

Organic Finishing, v. 6, pp. 21-22, 24-26, July 1945. Stockhausen, F. H.
Combating corrosion with plastic coatings.

Controls

Sci. News Letter, v. 48, pp. 3, July 7, 1945.
Thickness of steel in walls of a boiler tank, or the level of liquid inside the tank, can now be determined accurately by using a new instrument, the Penetron.

Heat

Cambridge Phil. Soc., Proc., v. 41, pp. 43-49, Apr, 1945. Jaeger, J. C.
Conduction of heat in a slab in contact with well-stirred fluid.

Wash. Acad. Sci., Jl ., v. 35, pp. 201-217, July 15, 1945. Stimson, H. F.
The measurement of some thermal properties of water. Bibliography.

Can, Paint & Varnish, v. 19, pp. 40, 84, July 15, 1944.
Infra-red finish drying speeded with gas.

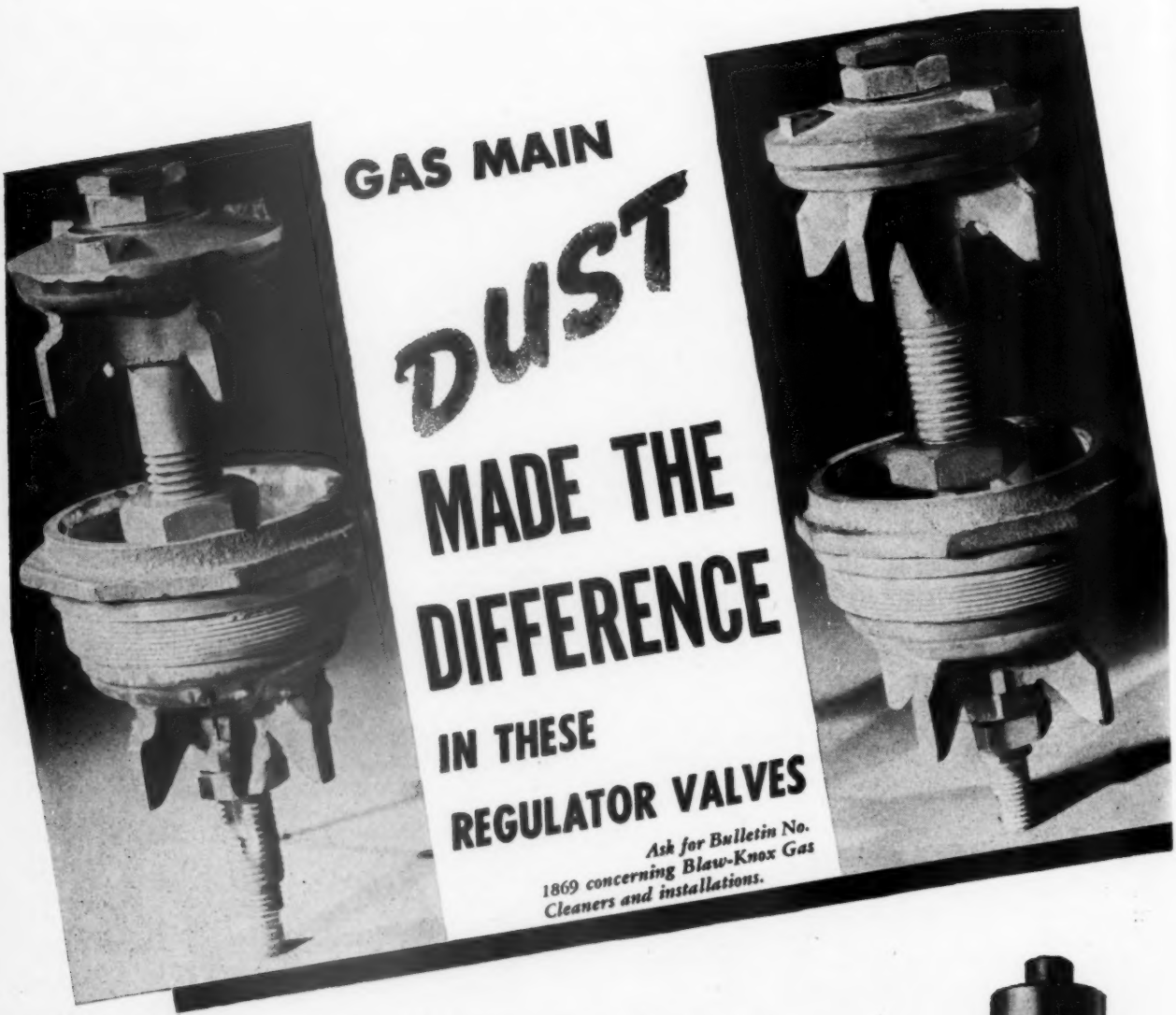
Metals

Elec. Mfg., v. 36, pp. 117-119, 224, July, 1945. Alico, J.
Magnesium to be postwar factor in product design.

Modern Metals, v. 1. pp. 8-12, June, 1945. Hotchkiss, A. R.
Progressive heating, quenching.

Product Engg., v. 16, pp. 438-441, July, 1945. Shepherd, B. F.
Mechanical and metallurgical advantages of martempering steel.

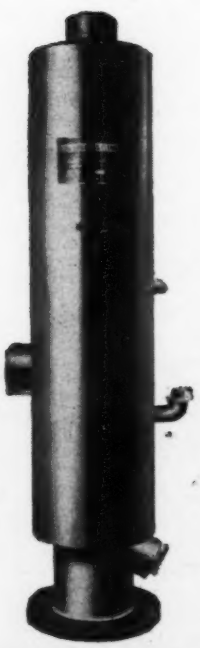
Modern Metals, v. 1, pp. 16-20, Feb., 1945. Brown H.
Melting aluminum.



Notice the deep irregular erosion cutting into the valve face and the lower part of the valve stem on the left above, compared with the normal shape of the valve at the right which has been in use in a clean gas stream.

Gas main dust is ruinous to regulator valves, meters and more expensive apparatus. It is responsible for rising costs for maintenance, replacements, service complaints and "unaccounted for" losses.

The cure is simple, practical and positive. Blaw-Knox Gas Cleaners installed at strategic points in the system, remove gas main dust. CLEAN GAS PAYS PROFITS.



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Trends in Metallurgical Heating Here and Abroad

VARIOUS groups in the industry, both in this country and in England, agree that the new trends in metallurgical heating equipments and methods can generally be classified under the following headings: high-speed heat transfer, heating light weight alloy metals uniformly and special atmosphere and radiant-tube heated furnaces.

Each of these subjects is covered in some detail in the material which follows:

High-Speed Heat Transfer

For some five years an improved method of combustion consisting of pre-mix gas and air mixtures under pressure has been achieving some remarkable results, especially during our period of participation in the war. Using this principle of combustion has resulted in developing entirely new types of gas-fired equipments which in no way resemble the old conventional furnaces. They are heating machines which might actually be regarded as machine tools, for the flow of materials through the devices is continuous with unskilled help turning out work, aided by push-button controlling. These heating machines are being used for brazing, soldering, surface hardening and numerous other applications of continuous heat treating.

Very great reductions in processing times in a wide range of uses has been possible with this development because of the higher speeds in heating.

In order to withstand the critical operating conditions due to the high heat liberation and other considerations, it is impractical to use any metal in the burner assembly, ceramic material being used in its place.

Selective heating is possible, using this new method of heating, giving uniformity of heating to all parts of non-uniform sections. This is especially helpful in heat-treating heavy ordnance parts.

This new development in combustion can be summarized with the following advantages:

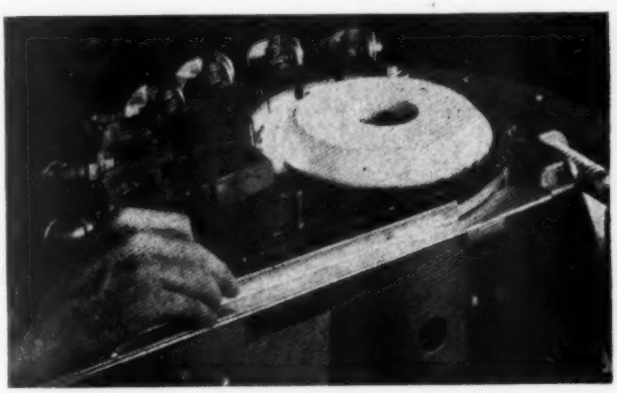
1. Very high rates of heat liberation (60 million B.T.U. per c.f. of combustion space per hour) are possible through the use of higher pressures for the pre-mixed gas-air mixtures.
2. Entire combustion space is built into the burner itself with no flame extending beyond the burner body. Because of this feature, heating units can be placed very close to the work being heated.
3. In both radiant and convection heating, higher thermal heads are possible. The high stack temperature resulting from the use of higher thermal heads is more than offset by the savings in time, labor and improved heating.

Heating Light Weight Alloy Metals

In the heating of light weight alloy metals, care must be exercised to apply the heat uniformly and quickly to moderate temperatures without overheating. Fused salt baths is one of the numerous methods of heating available, having been used extensively in the treatment of aluminum and magnesium alloys.

Another popular method of treating such alloys is that of forced-air circulation furnaces, especially where the quantity of materials is large. The charges are placed so that the recirculating heated air can properly circulate throughout the charge and reach each part, in the interest of rapid heating and uniformity.

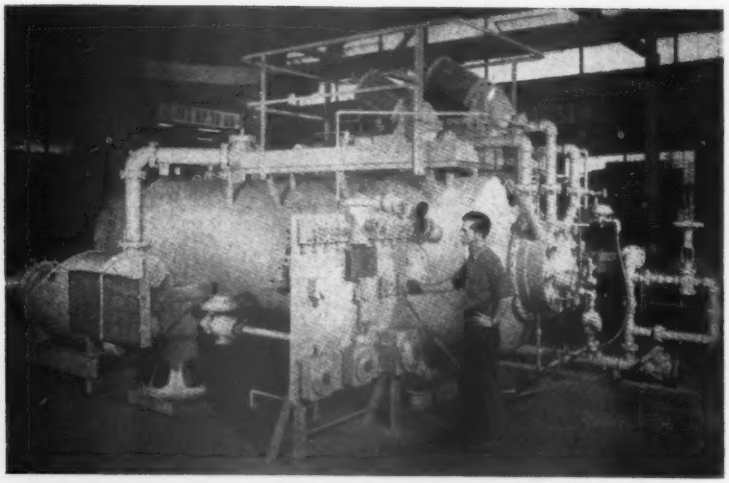
In order to eliminate sulphur from the furnace gases, atmosphere control is a "must" for heating some types of aluminum alloys. Moisture is also another undesirable agent which is removed by controlling or dehumidifying the furnace gases. In treating magnesium, sulphur compounds are deliberately added to the



Compacted - combustion gas burners shown here are being used for continuous strip hardening.

Left: A battery of Lee Wilson Engr. Co. gas fired bell type furnaces, two center units are shown with burner assembly removed. Furnaces are used for coiled strip annealing offering the most uniform temperature distribution.

Right: Operation of a Lee Wilson bell type furnace with vertical radiant tubes for uniform annealing.



Kemp unit, complete with controls, for producing inerts or nitrogen.

furnace atmosphere as a protective measure.

Direct-fired furnaces for aluminum alloys are so arranged that the products of combustion are thoroughly diluted to avoid local overheating. A satisfactory mixture would be 70% of air with a low sulphur content permitted.

Due to the formation of acid, sulphur dioxide and moisture are very unsatisfactory in the heat treating of magnesium.

A control accuracy of plus or minus 5% is considered essential for heat-treating light alloy metals, as rapid rates of heating involve the difficulty of over-riding of temperatures, resulting in some instances to melting of eutectic areas.

Special Atmosphere and Radiant-Tube Heated Furnaces

The predominant trend in industrial heating processes is the use of controlled atmospheres in heating chambers of furnaces to protect the surface of the work, to effect chemical changes or for other special purposes. In fact, in England and also here in this country, it is generally agreed that all metals can now be bright annealed by the use of the proper furnace and the proper atmosphere.

In the modern concept of things, modern furnaces are regarded as machine tools and, as such, they are put right into the production line. Automatic handling of material in the furnace is receiving ever increasing attention in the industry.

Considerable work has been done recently on the control of the dewpoint of furnace atmospheres, with special reference to continuous determination and recording of the amount of water vapor present in the furnace.

The use of gaseous atmospheres for the carburizing of steel has been greatly expanded. Recently a method has been developed using gas atmosphere for the recarburizing of decarburized steel.

Radiant-tube heated furnaces of the cover-type, designed to be gastight without an inner cover, are now being used for short-cycle malleablizing of castings. In England these radiant-tube special atmosphere furnaces are being extensively used instead of haematite ore and boxes. In the wire industry increasing numbers of bell-type furnaces with inner covers are being used for annealing of wire. To improve the heat transfer and uniformity of treatment these furnaces recirculate the atmosphere within the cover by means of a circulating fan.

Book Review

Lincoln Welding Handbook

"Procedure Handbook of Arc Welding Design and Practice," eighth edition, published by The Lincoln Electric Co., Cleveland, Ohio; 1,312 pages, 6 x 9 inches, 1,647 illustrations, including photos and drawings; cover, semi-flexible simulated leather, gold embossed; price postpaid United States $1.50 per copy, elsewhere $2.00 per copy.

Entirely revised to include the latest data on new arc welding methods and equipment, the eighth edition of the "Procedure Handbook of Arc Welding Design and Practice" has just been announced by the publishers.

The book, which includes details of the most recent welding methods and techniques, many of which played such a dominant part in winning the European war and in assuring final victory in the Pacific, incorporates a wealth of new information that obsoletes much of the previous literature on welding.

Special effort has been made by the authors to provide complete information to help those in all fields of industry obtain the greatest possible benefits from the process of arc welding in the design and construction of various parts and products and in the use of the process as a maintenance tool.

In addition to standard data on welding symbols, speeds and costs, characteristics of metals, pre-heating, stress relieving, approach to welded design and other pertinent information, the newly revised Handbook includes sixteen new subjects such as

New cost tables
New welding techniques
Mathematical calculations for new weld-designed structures
Latest steel specifications on S.A.E. and A.I.S.I., including National Emergency Steels, etc.
Underwater cutting
Shop ventilation
Maintenance of welding equipment
Methods of testing
Filler metal specifications for arc welding electrodes

Production and Uses of Oxygen. A 24-page, two-color booklet, "Oxygen—Indispensable Servant of Industry," profusely illustrated and fully telling the interesting story about oxygen—how it is made and how it is used in industry—has been published by Air Reduction Sales Co., 60 E. 42nd St., N. Y. 17, N. Y.

Photographs and text tell how 99.5% pure oxygen is guaranteed users and why this higher oxygen purity assures greater economy and maximum end-use efficiency of the product.

Other explanatory sections describe the different types of "packages" for varying oxygen volume requirements, operating conditions ,and internal plant gas distribution methods. Descriptions of hand and mechanical welding, flame hardening, flame cleaning, underwater cutting, hand and machine gas cutting and other flame processes are included.

Dust Collection. Bulletin #101 issued by Aerotec Co. of White Plains, N. Y., deals with the problem of efficient fine dust collection, particularly in the range 325 mesh screen or finer. Included are precipitating tests on various dusts in the industrial field. Copy sent on request to Thermix Engineering Co., First National Bank Bldg., Greenwich, Conn., Project and Sales Engineers for the Aerotec Company.

Illinois Power Co. Announces Plans for Appliance Merchandising and Dealer Cooperation

THE Illinois Power Co., Decatur, Ill., has inaugurated a publication called "Dealer News." In the foreword they state: "Now that the war is won—and reconversion to peace conditions is our urgent concern—it is important that trade associations know our thinking and that we should know theirs, particularly on the vital question of appliance merchandising.

"As we see it, reconversion from total war to total peace is going to be a gradual process—cut and fit to meet conditions as they arise. That is why, for our part, we have kept deliberately open-minded on future planning, in the belief that this is preferable to being locked into a too premature policy.

"This leaves us free to weight each step carefully and currently in the return to new business promotion.

"It provides for all necessary consideration of the three important questions which should underlie each step:—(1) what merchandise is available?; (2) can dealers and will dealers cover the market alone?; and (3) what practical cooperation can a utility sensibly extend to help develop a backward market?

"Our long-range objective, before the war, and now, is to reach the promotional point where dealers can take over all merchandise sales.

"As fast as a market is built up and stabilized so that acceptance can be maintained and an attractive dealer profit be made, we no longer have a logical place in the sales picture.

"Until such a market attracts sufficient dealers to properly serve the public or keep pace with demand, we feel that we have an obligation as well as a privilege to develop that market through direct sales.

"If dealers agree with this thinking, which to us seems fundamentally sound and favorable to a mutually beneficial relationship, we can see our way clear to set up certain definite guide-posts in our planning for dealer cooperation which can be marked for the record and which should not be disturbed, regardless of future circumstances that may transpire.

"These guide-posts have been patterned, not only upon our own experience and observations, but also upon adopted principles suggested by the Edison Electric Institute and the American Gas Association for nationwide consideration.

"Here they are for your own individual consideration."

The Sales Program

1. Sales Emphasis: *We plan to direct our own appliance sales operations so as to encourage maximum volume by all outlets. Special emphasis will be placed on appliances and equipment not having adequate customer acceptance.* This means, as mentioned above, that we shall withdraw from competitive selling wherever markets are mutually decided by dealers and ourselves to be well established and maintained by dealers. It means that we shall continue to concentrate direct sales effort upon appliances, in any locality where they do not have adequate public acceptance, until such time as dealers can and will take over the entire selling job. It further means that we shall not engage in any active selling at all until dealers have had every reasonable chance to obtain the first available "over-the-counter" merchandise in the more highly saturated markets.

2. Sales Franchises: *We shall provide equal opportunities for dealers to sell any makes of appliances sold by us.* This means that we shall forego all claims to any exclusive franchise, leaving the determination of sharing a franchise entirely up to dealers and manufacturers.

3. Sales Practices: *Appliance sales will be made on the basis of fair and open competition, this being in the interests of the public, of appliance manufacturers, and of all those engaged in the distribution of appliances at wholesale or retail.* This will apply wherever it is agreed upon that sales effort on our part is advisable.

4. Quality of Merchandise: *Appliances offered for sale should be of a quality which will result in safe, dependable and efficient operation.* This means that where we do sell, we shall sell only the highest-grade merchandise, as an incentive to stepped-up quality sales.

5. Appliance Service: *To assure a maximum of customer satisfaction, adequate maintenance service will be made available.* This should not be taken to mean that we in this particular territory can immediately

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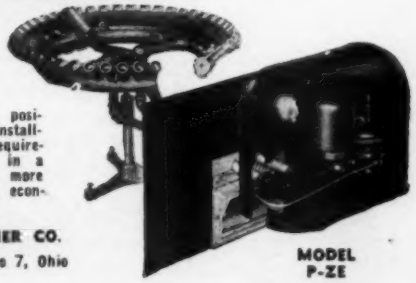


COLUMBIA BURNER CO.
729 Ewing St., Toledo 7, Ohio

MODEL P-ZE

extend repair service on all makes of appliances. That is a service which might encroach on the dealer's own source of income, and which presents serious difficulties in the way of huge inventories and scarcity of expert manpower. It may be a matter which can be considered later on, if dealers as a whole are favorable. As far as we are concerned, it does mean that we intend to amplify customer satisfaction and cooperate with dealers through the employment of additional Home Economists, engineering and installation advisors and other skilled personnel at the call of both customers and dealers.

6. Special Offers: *In planning special offers or sales inducements, the utility should have in mind the importance of making it possible for retailers to join in, thus stimulating their merchandising activities.* It is not our intention to make special offers or sales inducements except in the building up of undeveloped markets in which dealers as a body, are not yet interested. These markets would be such as gas house-heating, and automatic water heating which need active stimulation in most localities before wider-spread public acceptance can make them profitable for any substantial number of dealers.

7. Deferred Payment Plans: *Deferred payment plans applicable to appliances will be economically sound, and within the financing terms available to retailers. The merits of the appliance, rather than the terms of sale, will be the controlling buying motive.* Before the war we endorsed a finance plan for dealers, which not only offered the same terms as ours, but also provided for our billing and collecting for dealers. It is uncertain at this stage whether the majority of dealers will want such facilities after the war. If they do, a plan can be worked out. In any event, our own terms of sale will be held to such as dealers can readily meet.

8. Advertising: *Advertising and displays should, so far as is practicable, recognize and support the retailers.* All advertising and displays, as before the war, will continue to stress *usage*—not any specific make of appliance. Mention of "See your Nearest Dealer" will be prominently set forth in all messages. We will advertise all services generally for the benefit of dealers, whether or not we sell the merchandise ourselves.

The Effect of Wall Insulation On Wood Frame Construction

SECURING greater comfort in the home with the same heating system, is surprisingly easy. All that needs to be done is to warm the walls. And insulation, in its various forms, and with available insulating materials, will do that.

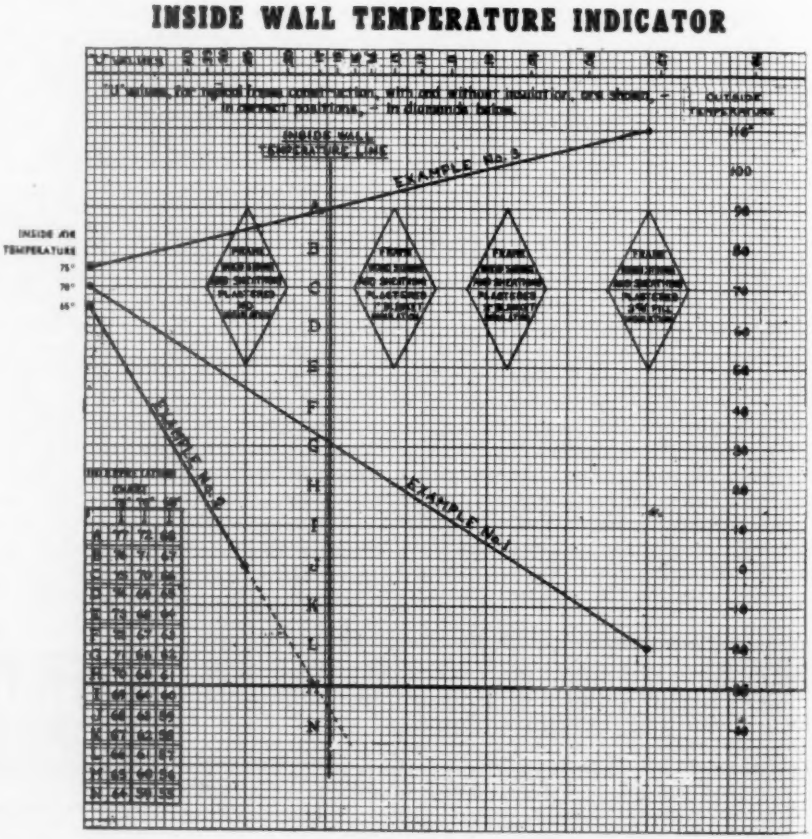
Heating engineers use a complicated formula for determining the inside temperature of a wall, with any given inside and outside temperatures. This has been reduced to chart form by National Mineral Wool Association.

Lay a rule on the chart which accompanies this story. The rule will tell you what your inside wall temperature is, or will be, in any weather.

And even more important, it will tell exactly how much warmer your walls will be after you have installed insulation of various kinds and thicknesses.

Your inside wall temperature, with a common, uninsulated frame house, having inside temperature of 70, and outside temperature of zero, will be 59 degrees. Since anything lower than 60 is poor, from the viewpoint of both comfort and fuel saving, let us see what happens if the wall is blown full of insulation. (This is based on the use of insulation having a "k factor" of .27, such as mineral wool). The temperature will be 67. This is in the excellent range, anything from 66 upward being considered "comfortable," and at the same time surprisingly economical for gas heating.

Copies of the chart—7" x 7½" are available by writing National Mineral Wool Assn., 1270 Sixth Ave., New York City.



Example No. 1: "U" is .0714, the value for standard frame construction with full-thick Mineral Wool insulation, the outside temperature is 20° below zero and the inside air temperature is 70°. The plotted line crosses the vertical base line at G. The Interpretation Chart shows that G equals 66°, the inside wall temperature.

Example No. 2: "U" is .25, the value for a frame house without any insulation, the outside air temperature is zero, inside the air temperature is 65°. The plotted line is projected to cross the base line between M and N, showing that the inside wall temperature equals 55°.

Example No. 3: This line, based on the same "U" value as in example No. 1, proves that insulation is useful in summer, too. The outside wall temperature is 110°, inside air temperature is 75°. The plotted line crosses at A. The Interpretation Chart indicates a wall temperature of 77°.

Gas Industry Launches Its Post War Program

Nearly three years ago the American Gas Association appointed a Post War Planning Committee to forecast changes that peace would bring and to recommend steps necessary to meet changed conditions within the industry. This committee cooperated with committees on Economic Development planning prosperity for the entire country. As a result of its post war planning, it is one of the few industries that has a complete post war plan in operation, a plan designed for manufacturers, dealers and consumers.

As a further step in the industry's program, the Residential Gas Section of the American Gas Association has sponsored a series of thirty-one regional meetings in leading cities of the United States to acquaint gas utility and appliance companies with the program and to help them crystalize their own post war plans.

The program is designed to benefit all branches of the gas industry. It will present an all-gas merchandising program, showing gas companies how to establish home planning bureaus to sell immediately all segments of the residential market even with limited manpower. Dealers will be offered a specific plan for merchandising a complete "New Freedom" gas home.

The new home market is one of the most promising fields in the post war period. Architects and builders will play an important part in this productive market. The Residential Gas Section has a complete and comprehensive plan for enlisting the aid of these vital specialists in capturing the new home market for gas.

Green troops can't win battles. Competition in the post war era will be keener than at any time in history and the men who represent the gas industry on the firing line, more than ever, must be highly trained. This is true, not only of salesmen, but of all gas company representatives who contact the public. The American Gas Association has completed special courses specifically designed to indoctrinate all gas company employes and to provide complete sales training for gas company and dealers' sales personnel. These courses will be presented at the regional meetings.

Regional Meeting in New York

One of these regional meetings was held in New York at the Biltmore Hotel on September 17th, presided over by B. A. Seiple, V.P. in Charge of Sales of the Jersey Central Power & Light Company.

Following his opening remarks, a picture and sound track presentation of "Mobilizing for Tomorrow's Markets" was offered by E. A. Weaver, Sales Manager of the Space Heating Division of Surface Combustion Corporation. It portrayed in word and picture the interviews of the prospective home builder with his local gas company. This film and sound track are available to gas company managers for display use on application to Surface Combustion Co.

"A Key to the New Home Market" was presented by H. P. Morehouse of Public Service Electric & Gas Co. of Newark, N. J. This presentation is to be widely offered at regional meetings sponsored by A.G.A. Residential Gas Section.

It deals with a reference manual in loose leaf form, being a standardized presentation of data for architects and builders, on gas appliances and equipment for the home.

The preparation of this Manual has been under way for some two years and involves a cost of about $70,000. A standardized form of presentation is used, with dimensional features of each appliance for planning layouts.

The Manual will be ready for distribution by December 1st, or before. There will be a first edition of 15,000 copies. Price to A.G.A. members, $3.45.

Following a luncheon, the afternoon session of this meeting included addresses by James I. Gorton, "CP" Promotional Director of A.G.A.E.M.; J. L. Johnson, Sales Manager of Providence Gas Co.; G. M. Rohde, Ruud Manufacturing Co. and F. W. Williams, Secretary of Residential Gas Section, A.G.A.

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News of the Gas Industry

Resolutions Adopted by Executive Board September 12, 1945

The Executive Board of the American Gas Association received with extreme regret the resignation of Major Alexander Forward as Managing Director and views with deep appreciation his long and valued services to the Association and to the gas industry of the United States and Canada.

In 1923 Major Forward was appointed Secretary-Manager of this Association and brought to his new position a splendid record of achievement as a well-loved and highly esteemed newspaperman, editor, military officer and public official of the State of Virginia and of the federal government. He guided the Association through its reorganization period with unusual foresight and ability, and in 1927 was appointed Managing Director.

During his twenty-two years of service, Major Forward has administered the affairs of the Association with unfailing loyalty, high efficiency and steadfast perseverance, and has, through his wise counsel, keen vision and fine understanding, exerted a continuously constructive influence in the deliberations of this and its predecessor Boards. On the occasion of his retirement the entire gas industry pays high honor and tribute to Major Forward for the leading part which he has had in the development of the influence and activities of the American Gas Association for the betterment and advancement of the industry.

The contribution which Major Forward has made in the management of this Association goes far beyond the performance of his official duties. It includes those qualities of character and personality which have won for him as a man the admiration, respect and affection of his associates and of all members of the gas industry. His devotion to duty, high sense of justice, quiet dignity and personal integrity stand as an example to all, and his innate courtesy and constant consideration for others make him a delightful companion and cherished friend. He has inspired all those with whom he has come in contact with the highest principles of business and personal conduct, and has rendered invaluable service to individual members of the Association through his personal help and advice.

Resolved, Therefore, that this Board, in accepting Major Forward's resignation, express to him on behalf of the gas industry its deep gratitude and appreciation for the invaluable services which he has rendered, and extend to him its best wishes for a long and happy life, and

Be It Further Resolved, that an engrossed copy of this preamble and resolution be presented to Major Forward on the occasion of his retirement.

Annual Meeting A.G.A.

The annual meeting of the American Gas Association will be held in the Engineering Societies Building, 29 West 39th Street, New York, N. Y., on Wednesday and Thursday, October 24 and 25, 1945.

The two mornings will be devoted to General Sessions while the afternoons and evenings will be given to meetings of the Departments, Sections and General Committees.

Beckjord Becomes President Cincinnati Gas & Elec. Co.

Walter C. Beckjord, President of Columbia Engineering Corporation and Vice President and Director of Columbia Gas & Electric Corporation, has been elected President of Cincinnati Gas & Electric Company by the Ohio utility's Board of Directors. He succeeds H. C. Blackwell, who asked the board to accept his request for retirement in accordance with provisions of the company's retirement plan adopted several years ago.

Walter C. Beckjord

Mr. Blackwell remains actively with the Company. He was elected Chairman of the Board following the acceptance of his resignation as President.

Beckjord, who served as President of the American Gas Association in 1940, has been identified with the utilities industry since 1909. He was graduated from the University of Minnesota as an electrical engineer. Upon his graduation he went with the St. Paul Gas Light Company, a subsidiary of the American Light & Traction Company of which Mr. Beckjord later became Vice President and General Manager. In 1930, he became Vice President and General Manager of the Boston Consolidated Gas Co., Boston, Mass., leaving there in 1934 to join the Columbia Gas & Electric Corporation as Vice President and General Manager. Beckjord has taken an active part in the work of the national associations representing gas and electric industries and served as President of the American Gas Association in 1940.

Blackwell went to Cincinnati from Kansas City, Missouri, in 1924, as Vice President and General Manager of the local companies. He entered the public utility field as engineer with the People's Light Co. of Davenport, Iowa, in 1906. He became Vice President and General Manager of the Kansas City Power & Light Co. Blackwell has been active within the associations representing the public utility industry and has served as President of the Association of Edison Illuminating Companies since 1941. This Association ranks as the oldest of such organizations in the electrical field.

Officers Pacific Coast Gas Association

Because the Association was not able to hold an Annual Meeting for the official election of officers, a postcard ballot was sent out permitting each member to cast a vote of ratification of the report of the Nominating Committee.

The new officers:

President: H. W. Edmund, Vice President and General Manager, Coast Counties Gas and Electric Company.

Vice President: LeRoy M. Edwards, Vice President and General Manager, Pacific Lighting Corporation.

Treasurer: D. G. Martin, General Auditor, Pacific Gas and Electric Company.

Directors: (2 year term)

H. W. Geyer, Utilization Engineer, Southern Counties Gas Co.

M. A. Pooler, President, Tucson Gas, Electric Light & Power Co.

E. D. Sherwin, Vice President in Charge of Operation, San Diego Gas and Electric Co.

E. H. Sutton, President, Mission Water Heater Co.

A.G.A. Elects Two Directors

J. N. Greene, president, Alabama Gas Company, has been elected a director of the American Gas Association, to fill a vacancy until November 1, 1945, caused by the resignation of H. Carl Wolf, who became Managing Director of the Association on October 1.

Henry Fink, general manager, Michigan Consolidated Gas Company, was elected a director to fill the unexpired term ending October 31, 1946, caused by the death of John W. Batten, former president of the Michigan Consolidated Gas Company.

American Gas Assn. Appointments

Appointment of Arthur Q. Smith as Publicity Director of the Industrial and Commercial Gas Section, American Gas Association has been announced by J. French Robinson, President.

Mr. Smith comes to A.G.A. with an overall background of experience in advertising and publicity gained in an advertising agency of which he was a partner for a number of years. Subsequently he was Advertising Manager of The Commonwealth & Southern Corp.

Previous to joining A.G.A. Mr. Smith was with the National Association of Manufacturers on field promotion, public relations and publicity.

Mahlon A. Combs has been appointed Assistant Secretary of the Industrial and Commercial Gas Section. He has had twenty-five years experience in the gas industry, starting with Consolidated Gas Company, New York as a Gas Utilization Engineer. Following that he was engaged in industrial gas sales engineering for Maxon Premix Burner Company. For fifteen years he was with American Gas Products Corp., and was General Sales Engineer of that company when it was absorbed by American Radiator and Standard Sanitary Corp., where he continued on as Gas House Heating and Air Conditioning Engineer.

For a number of years Mr. Combs served on the Gas House Heating and Air Conditioning Committee of the New Jersey Gas Association, and was its chairman for one year.

St. Petersburg, Fla. to Improve Gas Plant

St. Petersburg, Fla., will soon start making needed improvements in its gas plant. The city plans to issue $700,000 of revenue certificates against the gas plant, and the work will start as soon as the certificates are sold.

City Manager, C. F. Sharpe pointed to the basic fact that the gas plant, established in 1914, was so inadequate in capacity and so obsolete in many of its parts that additions and a general overhauling were "musts." An expert survey showed that, as the book-accumulated depreciation on the plant was $1,006,667. New capital expenditures already started and planned through 1948 will cost, it is estimated, $667,000. Replacement, expenditures will reach $120,000. The total of the proposed revenue issue would be $700,000.

E. F. Jeffe Returns to Edison Co. as V.P. in Charge of Sales

Brigadier General E. F. Jeffe of Washington, D. C., who left consolidated Edison Company in May, 1942, to enter military service, was, on September 25th, elected vice-president of Consolidated Edison Company. He will be in charge of sales activities. L. A. Scofield, general sales manager, was elected assistant vice-president. N. T. Sellman, formerly assistant vice-president, has resigned and will give his entire time to his duties with Westchester Lighting Company, where he is first vice-president.

Laboratories Plan Annual Inspections

Manufacturers of gas appliances have been notified by the American Gas Association Testing Laboratories that annual inspections of approved appliances in production will be started soon.

According to R. M. Conner, Director, a number of inspections this year may be made somewhat later than usual in order to give time for the process of reconversion to peacetime appliance production. It is expected that several months will be required to carry out the entire annual inspection program.

Approval of appliances found in the field to comply fully with Laboratories' records will be renewed for the year 1946. The majority of inspections will be made from the Cleveland Laboratories and the remainder from the Pacific Coast Branch. Ample advance notice will be given manufacturers so that mutually satisfactory arrangements can be made.

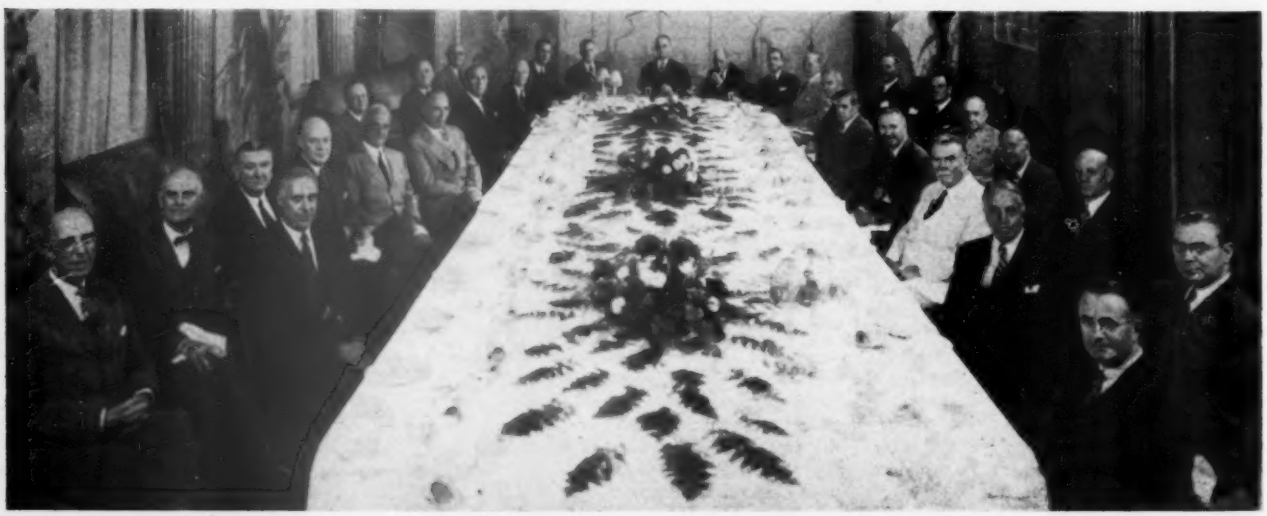
In addition to factory visits, inspections will be made in warehouses where appliances are stored, in department stores and on dealers' sales floors. Calls are also occasionally paid to consumers' homes for the purpose of checking not only individual appliances but their installation as well.

Alexander Forward Tendered Testimonial Dinner

The Executive Board of The American Gas Association tendered a testimonial dinner at the Waldorf-Astoria Hotel on September 11th to Mr. Alexander Forward, who is retiring on October 1, after twenty-two years as Managing Director of the Association.

Mr. Forward was formerly a newspaper man and city editor with Virginia daily papers. He served as Secretary to the Governor of Virginia from 1914 to 1918 and was appointed to the Virginia State Corporation Commission in 1918. After re-election to the Commission in November, 1923, he resigned to become chief executive of the American Gas Association on December 15, 1923.

GUESTS AT TESTIMONIAL DINNER TENDERED BY EXECUTIVE BOARD, AMERICAN GAS ASSOCIATION TO MAJOR ALEXANDER FORWARD, RETIRING MANAGING DIRECTOR, AT HOTEL WALDORF ASTORIA, SEPTEMBER 11, 1945.
(Outer Row, left to right) Marcy L. Sperry; Geo. S. Hawley; Edward F. Barett; R. H. Hargrove; Walter C. Beckjord; Percy S. Young; R. M. Conner; C. A. Tattersall; George W. Bean; Kurwin R. Boyes; E. P. Noppel; and E. Holley Poe. (At table, left to right) Ernest R. Acker; Everett J. Boothby; Major Forward; J. French Robinson; Major T. J. Strickler; Hudson W. Reed; V. T. Miles; R. J. LeBoeuf, Jr., F. M. Banks; George E. Whitwell; John W. West, Jr.; H. Leigh Whitelaw; Henry R. Cook, Jr.; Harry K. Wrench; C. E. Packman; Barney V. Mullaney; George H. Smith; and E. J. Tucker.



"BOMBS BURSTING IN AIR"

The Gas Holder, apparently intact, is all that remains upright on the site of the Nagasaki Gas Works. Drums and miscellaneous fittings are scattered amid the debris in the foreground. In the background skeletons of buildings rise above the ruins. *Acme Photo*

Nagasaki, second Japanese city to feel the fury of the atomic bomb, is in ruins today, as the result of the August 9th bombing. The single bomb, which floated to earth supported by three parachutes and exploded 1,500 feet above the heart of the manufacturing district, destroyed practically everything over a four mile area. Witnesses said first there was a large flash, followed by the explosion. Then they saw waves of air which looked like a pool of water after a pebble had been dropped into it. The Mitsubishi Steel Works, situated a mile away from the scene of the blast, was flattened completely, leaving only twisted steel skeletons. It is estimated that 18,000 buildings were disintegrated, 26,000 people killed, 40,000 wounded, and 10 to 20 of the wounded dying daily. The adjoining picture, illustrating the intensity of the destruction, was taken by Acme War Correspondent Stanley Troutman, who was with the first group of Americans to enter the area.

Atomic Power as a Source of Heat

The most probable utilization of nuclear energy, the basis for the atomic bomb, is as a source of heat, according to heads of engineering and research for the General Electric Company, in answer to many questions received from industry and the general public alike, asking about the potentialities of atomic power.

Concerning the possible use of nuclear energy as a source of power to heat and light homes and buildings, operate factories, propel ships, locomotives, airplanes, and automobiles, Harry A. Winne, G-E vice president in charge of engineering policy, and Dr. C. Guy Suits, vice president and director of the G-E Research Laboratory, predicted that several prospective uses of nuclear energy will become technically possible, but that it is too early to predict whether such uses will be economically practical.

In stating that the most probable utilization of nuclear energy is as a source of heat, the General Electric officials said that such heat in turn may produce steam or hot gases for use in conventional types of power generating equipment.

"As to the possibility of direct conversion from nuclear energy to electric power in usable form, this seems to us an extremely remote possibility," said Mr. Winne and Dr. Suits. "There is a long road of development ahead. It is true that the success of the bomb demonstrated that we can release a tremendous amount of nuclear energy in one instantaneous blast, at a controlled time. But to make this form of energy commercially useful, we must learn how to generate it and control it in a way that is adaptable to power production. We have no doubt that we shall learn how to do this, but the learning will take a lot of research, development, and time."

Many scientists and engineers were assigned by General Electric to the atomic bomb project. Mr. Winne supervised the development and production of apparatus manufactured in virtually every G-E factory for the Government plants which produced the bomb. Dr. Suits directed G-E research activities on the project. As early as 1940, two members of the Research Laboratory staff, Dr. K. H. Kingdon and Dr. H. C. Pollock, were among the first to isolate uranium 235, used in nuclear energy research and in the manufacture of the atomic bomb.

CONVENTION CALENDAR

October

16 *New England Gas Association,* Appliance Servicing Conference, Boston, Mass.

17 *New England Gas Association,* Operating Division, Boston, Mass.

22-24 *Mid-West Gas Association* Gas School and Conference, Iowa State College, Ames, Iowa

24-25 *American Gas Association* Annual Meeting, Engineers Societies Building, New York, N. Y.

November

23 *Mid-Southeastern Gas Association,* Sir Walter Hotel, Raleigh, N. C.

26 *Independent Natural Gas Assn. of America.* Dallas, Texas.

Gas Generator Linings

A new bulletin, No. 5113, issued by the Carborundum Company, Refractories Division, Perth Amboy, N. J., deals with the use of "Carbofrax" silicon carbide linings for water gas generators. Attention is directed to long life in the high heat zone, and reduction in barring time.

Large illustrations in color show application of Carbofrax in five leading types of gas generators and a table indicates the number of circle brick units required for diameters from two to ten feet.

Copy of the bulletin available on request.

The Reliable Shut-Off for Street Mains

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds. Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

D. H. Houlgate Joins Staff of Southern California Gas Co.

Deke Houlgate, a prominent figure in the West Coast gas industry prior to joining the Army Air Forces as a lieutenant in July, 1942, received his discharge this past July and has joined the staff of the Southern California Gas Co., Los Angeles, as assistant to Vice-President F. M. Banks.

Deke Houlgate

For six years prior to joining the A.A.F. Houlgate had represented the American Gas Association and the gas industry in general as "ambassador' 'to Hollywood. In his recently assumed post with Southern California Gas Co. he will renew old friendships in Hollywood's motion picture and radio circles in addition to representing the gas company in a variety of business and professional ways.

In the promotional days of the late 1930's, Mr. Houlgate's activities in Hollywood helped to make modern gas appliances standard "props" whenever motion picture scripts called for glamour kitchens.

New Gas Plant at Vancouver, B. C.

Tenders have closed and contract will be awarded in the near future for a million dollar expansion program at the gas plants of the B. C. Electric Railway Company in Vancouver and Victoria. The company has received a tender of $650,000 for a carburetted water gas plant to supplement present gas facilities in Vancouver. A bid of $300,000 has been received for the erection of a smaller plant in Victoria.

E. H. Rohrer, manager of the gas department of the company in Vancouver, states that the new unit in Vancouver there will jump capacity to 12,000,000 cubic feet daily. Two present plants have a joint 9,000,000-foot capacity.

Employing the latest methods of manufacture by use of crude oils and surplus coke, the new plant will be self contained and modern. Expenditure is another part of the company's post-war $50,000,000 expansion program.

W. R. McLaughlin Appointed to Sales Mgr. Post

A. J. Kerr, General Sales Manager of Pittsburgh Equitable Meter Company, has announced the appointment of W. R. McLaughlin as Sales Manager for the Gas Products Division. In his new position Mr. McLaughlin will direct the sales for Emco meters, regulators ,and measurement and control equipment.

Mr. McLaughlin has spent his entire business career in the gas and oil industry, having been associated with the Arkansas Natural Gas Company for a period from 1919 through 1934 when he joined the Pittsburgh concern as a sales engineer. In this capacity he contacted a majority of the operating personnel in both gas and oil companies located in the six Southwestern states.

He was one of a committee of eight selected from industry to assist the faculty of the Texas College of Arts and Industries, Kingsville, Texas, in establishing a course in natural gas engineering. For this participation he was awarded an Honorary Degree in natural gas engineering by the college in 1938.

F. A. Deininger Rejoins Estate

F. A. Deininger, who has for nearly four years served as government contact representative for the Institute of Cooking and Heating Appliance Manufacturers, returned on October 1, to the sales management group of The Estate Stove Company. He will direct sales of Estate

Photo Underwood & Underwood
F. A. Deininger

Heatrola products through distributors located in the Middle Atlantic Division. Mr. Deininger joined the Estate staff in 1925, at the time when he came to the United States from France. He was born in Alsace Lorraine and immediately prior to his entry into this country he served in the Intelligence Division of the French Army of Occupation in the Ruhr Valley.

During the war period, "Fritz" Deininger has served the Institute and its members most satisfactorily and in doing so has made many friends throughout the industry.

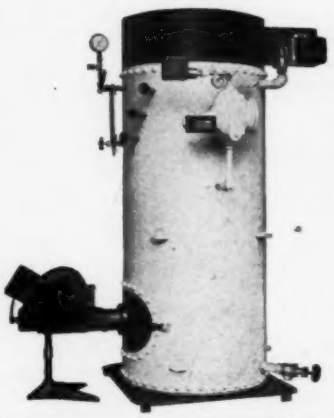
Wilputte Corp. Active in Coke Oven Construction

In addition to contract for 177 by-product coke ovens, consisting of three batteries of 59 ovens each, together with by-product recovery equipment, recently awarded to the Wilputte Coke Oven Corporation, affiliate of Allied Chemical & Dye Corporation, by the National Tube Company, a subsidiary of U. S. Steel Corporation, at Lorain, Ohio, the Wilputte organization is constructing 47 by-product coke ovens for Citizens Gas and Coke Utility at Indianapolis, Indiana. The National Tube project is the largest coke construction contract awarded by the steel industry in recent years.

The Wilputte organization is also active in the coke oven industry outside of the United States, having recently designed a by-product coke oven plant with by-product recovery equipment under construction by Australian Iron & Steel, Ltd., at Port Kembla, Australia. Wilputte is also designing by-product recovery and refining equipment for a large by-product coke plant in Mexico.

Wilputte Coke Oven Corporation has contributed materially in recent years to the advancement of the by-product coke oven industry in the United States through the construction of approximately 700 by-product coke ovens for leading industrial companies. Among companies at whose steel plants by-product coke ovens have been built in the United States are Bethlehem Steel Company at Lackawanna, New York; Republic Steel Corporation at Warren, Ohio, Gadsden, Alabama, and South Chicago, Illinois; Carnegie-Illinois Steel Corporation, a subsidiary of U. S. Steel Corporation, at Gary, Indiana; and Perry Furnace Company, a subsidiary of Interlake Iron Corporation, at Erie, Pennsylvania.

LATTNER
GAS — OIL BOILER
3 HP to 35 HP.



Burns natural gas or regular furnace oils with equal efficiency using same burner.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa

Dean Collins Moved to Shreveport, La.

M. D. Gilbert, District Manager for the Tulsa office territory of Pittsburgh Equitable Meter Company—Merco Nordstrom Valve Company, has announced the transfer of Dean Collins, service engineer, from Tyler, Texas, to Shreveport, La.

Dean Collins

This move was made to more centrally locate Mr. Collins in his territory, which embraces Northeast Texas, Northern Louisiana, and Arkansas.

Mr. Collins has lived in Tyler since 1937 when he first became associated with the company. In his own right an experienced petroleum engineer, he has made a very wide acquaintance among oil men in his territory. His experience covers the application of the many types of measurement and control instruments made by his firm, including Emco Gas Meters and Regulators, Pittsburgh Oil Meters, and Nordstrom Valves.

His present address in Shreveport is 1101 Janther Place, and his telephone number is 7-7221.

Waldo S. Hull Now Represents Pittsburgh Equitable Meter

Announcement has been made by A. J. Kerr, General Sales Manager of Pittsburgh Equitable Meter Company—Merco Nordstrom Valve Company, that Waldo S. Hull has joined the sales division of the company.

Waldo S. Hull

Mr. Hull was associated with the Central New York Power Corporation of the Niagara Hudson System from January 1927 to October 1942. He worked in the gas department of the Utica Area for this entire period, serving as superintendent of Gas Transmission and Regulation until being called to the War Production Board, Office of War Utilities, in Washington, in October, 1942.

In the Office of War Utilities, Mr. Hull served as Senior Industrial Engineer in the Gas Materials Section, Gas Division. He was concerned largely with assigning priority ratings, assisting the gas industry to secure critical materials during war-time. As a result of the relaxation of WPB control and curtailment of activities of the OWU, Mr. Hull was free to accept the Pemco appointment.

In his new connection he will handle the sales and service of Emco Gas Meters and Regulators, and Nordstrom Lubricated Valves in the Philadelphia and Washington trading area. Mr. Hull will make his home in Philadelphia, Pa.

E. E. Frederick Placed in Charge of All Field Services

W. A. Matheson, manager of the Williams Oil-O-Matic Division, Eureka Vacuum Cleaner Company, announces the appointment of E. E. Frederick as National Service Manager. Mr. Frederick, manager of the plant's standby facilities for Ordnance since October, 1944, now assumes charge of all field service. In addition, he will head the handling of parts, repairs, factory re-builds, and claims. Mr. Frederick is a veteran of World Wars I and II and holds the commission of major in the inactive reserve of the United States Army.

Industrial Oven Eng. Co. Opens Chicago Branch

The Industrial Oven Engineering Company of Cleveland has opened a branch office in Chicago, located at 332 South Michigan Avenue. This firm designs and manufactures all types of ovens and oven processing systems for temperatures up to 1000° F.

In charge of the Chicago office are H. W. Munday and F. T. Greaves, both graduate engineers and specialists in industrial heating problems. Mr. Munday is a director of the Armour Research Foundation and a trustee of the Illinois Isntitute of Technology.

H. C. Erhard Elected V.P. Standard Gas Equip. Corp.

W. Frank Roberts, president of Standard Gas Equipment Corporation, announces the election of Herbert C. Erhard, General Sales Manager, as Vice-president in Charge of Sales at a recent meeting of the Board of Directors. Mr. Erhard will have complete direction of sales of present products as well as new products that may be added. In addition, he will direct all advertising and promotion programs.

He is a member of American Gas Association and has been active in Industry affairs. He has served on WPB's Commercial Cooking Industry Advisory Committee and the Special Projects Committee of A.G.A.E.M., which recently framed the suggested post-war program for the CP Managing Committee. He is currently a member of A.G.A.E.M.'s Committee on Trade Shows and the Export Committee of the Institute of Cooking and Heating Appliance Manufacturers.

Bailey Meter Company Appoints Sales Executives

The appointment of W. E. Dueringer as Assistant Sales Manager and H. E. Weaver as Proposition Department Manager has been announced by H. M. Hammond, General Sales Manager of Bailey Meter Company, Cleveland 10, Ohio.

Both Mr. Dueringer, who is a graduate of the University of Illinois, and Mr. Weaver, who is a graduate of Johns Hopkins University, have been associated with Bailey Meter Company for over 25 years in various engineering and sales capacities.

Judging from the volume of "fan mail" and verbal inquiries it prompted, the "Let's Talk Houses" radio program in Portland, Ore., struck a responsive note in home-conscious listeners—so much so that the sponsor has prepared a booklet of highlights from the 13 broadcasts.

Shown looking over the mail that came in from listeners to the "Let's Talk Houses" radio forum sponsored by Portland (Ore.) Gas & Coke Company are R. G. Barnett (left), vice president and general manager; and Edwin Sandberg, president of the Portland Home Builders' Association whose members were featured on the 13 weekly broadcasts. Topics covered every phase of home building and the commercials drove home the idea of "New Freedom Gas Kitchens" in the minds of the highly selected listening audience.

F. B. Taylor Retires

F. B. Taylor, general superintendent Gas Construction Department, who retires after 37 years of service with Consumers Power Company, Jackson, Mich., can look back on those years of accomplishment with the satisfaction known only to builders. Mr. Taylor has built or supervised the building of power dams, gas plants, gas transmission lines, interurban lines, railroad bridges and waterways.

About 1919 he was engineer of the Gas Department under J. A. Brown. At that time many gas plants were built, including those at Flint, Royal Oak, Saginaw River Gas Plant and Springfield, Ill.

Mr. Taylor also supervised the construction of practically all of the long natural gas transmission lines owned by Consumers.

A. O. Smith Corp. Appoints H. L. Heakin to Western Post

H. L. Heakin has been named a district representative for the A. O. Smith Corp., covering northern California, Utah and Nevada, and will shortly establish headquarters in San Francisco, it has been announced by Ray E. Howes, administrator of the Los Angeles district of the company. Mr Heakin will handle all of the company's lines, which include pressure vessels, steel storage tanks, line pipe, oil well casing, railroad equipment, electrodes and consumer goods such as storage water heaters and domestic stokers. Mr. Heakin is a graduate of the University of Michigan and has done postgraduate work at Stanford University and the University of California. He has had previous connections with the Worthington Pump and Machinery Corp., the Pacific Foundry Co., Domestic Engineering Corp., Union Switch and Signal Co., and Westinghouse Air Brake Co.

Harry W. Smith Jr. Joins J. M. Lupton Co.

Harry W. Smith, Jr., well known to the gas industry through his work as advertising manager of Selas Corporation of America (1941-45), director of publicity for the Industrial and Commercial Gas Section of the A.G.A. (1938-41), and research engineer and publications man for the A.G.A. Testing Laboratories in both Cleveland and Los Angeles (1931-36), announces affiliation with The John Mather Lupton Company, advertising agency, 420 Lexington Avenue, New York City, beginning October first. He will serve as vice president.

At Lupton he will work primarily on stainless steel, metallurgical, chemical and industrial publishing accounts—in addition to general managerial duties.

Gas Appliances for Export

Manufacturers of Gas Ranges and Refrigerators interested in the Venezuela market are invited to contact Maximo Blum & Bro. of Caracas, through their New York office at 55 West 42nd Street, New York 18.

Cast Iron Equipment

Extensive data on the corrosion rates of cast iron exposed to the action of substances commonly handled by chemical structures feature a pamphlet, entitled "Cast Iron in the Chemical and Process Industries," recently published by the Gray Iron Founders' Society, national association of manufacturers of engineering gray irons. It is the work of F. L. LaQue, head of the corrosion engineering section of the International Nickel Company, Inc.

Results of laboratory and plant tests with more than 300 corrosive media in an alphabetical range from acetic acid to zinc sulfate are shown. The four appended tables also list the many chemicals regularly handled by cast iron pumps and valves and those resisted satisfactorily by high silicon irons.

Differences in the manner in which cast iron resists corrosion, the pamphlet notes, are related directly to the structure of the material and, particularly, to the presence of graphite flakes in a ferritic, pearlitic, or austenitic matrix. The corrosion resisting characteristics of gray iron may be altered by alloying and by foundry techniques since both affect the size, shape and distribution of the graphite particles and influence the corrodibility of the matrix.

The pamphlet is available at $1 per copy from the Society's Cleveland or Washington offices.

Pemco Corporation Active in Reconversion Program

Work is rapidly progressing at the Pemco Corporation on the installation of another wholly continuous smelter unit and further improvements are being made on the four continuous units now in operation. This expansion is but the first step in an ambitious reconversion program long planned for post war culmination. It is conservatively estimated that these additions and changes will increase the capacity of the plant more than fifty per cent.

Pemco officials emphasize the statement that the improvements now underway are but a small part of their expansion program. As men and materials become available this activity will be broadened.

Glenn G. Bartle Joins Staff of E. Holley Poe Associates

Glenn G. Bartle, natural gas geologist and former university dean, has joined the New York staff of E. Holley Poe and Associates, natural gas consultants, E. Holley Poe has announced.

Dr. Bartle was discharged honorably from the Navy recently, after serving as the commanding officer of the V-12 unit at Swarthmore College, Swarthmore, Pennsylvania. Previously, he had organized the courses of instruction in the Navy's anti-aircraft schools throughout the country.

Photo by Bachrach

Glenn G. Bartle

During the nine years preceding his induction into the Navy in 1942, Dr. Bartle was on the faculty of the University of Kansas City. He went to the university when it opened in 1933 and organized the geology department. Subsequently he served as dean of liberal arts for five years.

As student and teacher of geology, practicing geologist, consultant and producer of natural gas, Dr. Bartle has been active in the field since 1921. While maintaining a practice as consulting geologist in Kansas City, his clients included several large producers of natural gas and pipe line companies. He has estimated natural gas reserves in connection with actions before State and Federal regulatory bodies.

Explorations by Dr. Bartle have led to the discovery of gas fields in Kansas and Missouri. He has the additional industry experience of a producer, with wells in Missouri and Kansas, principally in the Hugoton Field.

Dr. Bartle is the author of several technical studies of the geology and production of natural gas. He is a member of the American Association of Petroleum Geologists, American Institute of Mining and Metallurgical Engineers, American Association for the Advancement of Science, Missouri Academy of Science, Sigma Xi and Kappa Epsilon Pi.

Gas Division of Oklahoma Utilities Association

The Gas Division of the Oklahoma Utilities Association held its annual meeting, a one-day conference, September 21 at the Biltmore Hotel in Oklahoma City.

Following the call to order by L. A. Farmer, President, Northern Oklahoma Gas Company, Ponca City, the program included the following:

"Legal Aspects of Exportation of Natural Gas," Marshall Newcomb, General Counsel, Lone Star Gas Company, Dallas, Texas.

"End Use of Natural Gas," J. H. Warden, General Sales Manager, Oklahoma Natural Gas Company, Tulsa.

"Fitting the Returned Veteran Into His Old, or a New Job," Milt Phillips, Secretary, State Veterans Service Committee, Oklahoma City.

"Selling, Sizing, Locating, and Installing Floor Furnaces," A. O. Beyer, District Manager, Coleman Co., Inc., Fort Worth, Texas.

"Helping Dealers and Manufacturers Sell Better Gas Appliances," Norman Hirschfield, Vice-President, Consolidated Gas Utilities Corporation, Oklahoma City.

"The New Freedom All Gas Kitchen," M. H. North, Advertising and Sales Promotion Director, Oklahoma Natural Gas Company, Tulsa.

Report From Servel, Inc., Seward Abbott, Regional Sales Manager, Servel, Inc., Dallas, Texas.

Gas Appliance Safety Committee Report, Carl Dean, House Heating Engineer, Oklahoma Natural Gas Company, Tulsa.

A luncheon at noon, presided over by D. S. Kennedy, President, Oklahoma Utilities Association, was followed by Entertainment introduced by Lauren Clegg, Consolidated Gas Utilities Corporation, Oklahoma City.

J. H. Doerres Succeeds Wehnert at Laclede Co.

H. C. Wehnert, Chief Engineer of the Laclede Gas Company of St. Louis, Missouri, for the past twenty years, resigned his position on October 1, 1945.

Mr. Wehnert came to Laclede in 1906 as a cadet engineer, soon after his graduation from Purdue University. His resignation has occasioned several promotions in the supervisory staff of the manufacturing department of the Company.

Mr. John H. Doerres, who has been superintendent of Laclede's by-product coke station for twenty years has been appointed to succeed Mr. Wehnert. He came to Laclede in 1913, a graduate of Ohio State University. Erwin Blind, who has been assistant to Mr. Doerres has been appointed to fill the former position of Mr. Doerres.

Other appointments include: E. L. Horner, superintendent of manufacture; Dave Turk, superintendent of water gas manufacture; G. B. Brothers, assistant superintendent of water gas manufacture. These men are all veterans in the Laclede organization.

Taber Elected President Atlanta Gas Light Co.

R. G. Taber has been elected President of the Atlanta Gas Light Co., Atlanta, Ga., succeeding H. Carl Wolf, who is now Managing Director of the American Gas Association, New York.

A contract for the sale of the Atlanta Gas Light Company to the Southern Natural Gas Company of Birmingham, Ala., has been announced by the Consolidated Electric and Gas Company in New York. The sale is subject to approval of regulatory agencies.

Surface Combustion Co. Sales Appointments

Leo B. McCoy has been appointed sales representative in the New Jersey territory for Janitrol gas-fired furnaces and burners. He formerly was with the Public Service Electric and Gas Co. as a heating and air conditioning sales representative, joining that company following his honorable discharge from the Army in 1943.

Mr. McCoy is working out of the New York district offices of Surface Combustion in his new position.

Carl H. Langendorf has been appointed sales and service engineer for the St. Louis territory. He was assistant office manager of McDonnell Aircraft Co. before returning to the Toledo organization.

Langendorf had been with the heating equipment manufacturer prior to the war, and formerly was with the Laclede Gas Company's house and commercial heating department for 10 years.

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• *cut* fuel costs

More than 440 CARBURIZING PLANTS, in 24 countries, testify to the outstanding advantages of GLOVER-WEST Systems.

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GLOVER-WEST CARBONIZING SYSTEMS

- ***LOWER*** Fuel Consumption and Maintenance
- ***FACILITATE*** Operation
- ***PRODUCE*** dryer, cooler Coke
- ***REQUIRE*** less Ground Area
- ***INSURE*** greater Flexibility

WEST GAS IMPROVEMENT CO.
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GAS METERS

RADAR

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PLAINFIELD, N. J.

R. B. HARPER

Robert Brinton Harper, 63, vice-president in charge of research and testing for the Peoples Gas Light and Coke Co., Chicago, Ill., died suddenly August 29.

R. B. Harper

Mr. Harper was born at Evansville, Indiana on February 28, 1882. Equipped with a Bachelor of Science degree in chemical engineering from Armour Institute of Technology, he entered the employ of the Company on June 26, 1905 as a laboratory assistant. On January 1, 1906 he was promoted to chemist in charge of the laboratory, and it was his intelligent guidance and indefatigable energy that stimulated the growth of gas research and testing into a mature technology, important not only as a Company function but as an Industry service. Successive promotions culminated in his election, in February, 1930, to Vice President in charge of the Division of Research and Testing.

He received the Beal Medal Award in 1931, was elected a Fellow of the American Association for the Advancement of Science in 1933, and a Fellow of the American Institute of Chemists in 1936. In 1938 he received the Walton Clark Gold Medal of The Franklin Institute and in 1944 was the recipient of Honor Scroll Award of the American Institute of Chemists.

M. D. READ

Maurice D. Read, 45, secretary and assistant treasurer of Minneapolis Gas Light Co., Minneapolis, Minn., died of a heart attack, Sept. 15th, at his home.

Mr. Read came to Minneapolis in 1935 from Benton Harbor, Mich., where he had been associated with the gas company.

Born September 16, 1899, at Cedar Rapids, Iowa, he attended Mexico military academy, Mexico, Mo., and Coe college, Cedar Rapids, Iowa, receiving his bachelor's degree in 1922.

He was vice president of Minneapolis Rotary club, a member of the board of directors of Westminster Presbyterian church and vice commander of Downtown American Legion post and a director of the Minneapolis Athletic club.

L. HOWARD GOLDBRIGHT

L. Howard Goldbright, Vice President and Treasurer of the Heating and Plumbing Finance Corporation, a subsidiary of the American Radiator & Standard Sanitary Corporation, died suddenly at his home in White Plains, New York, on September 1st. He was also Vice President of Heating and Plumbing Finance Ltd., Canada.

Mr. Goldbright has long been a leader in the field of installment financing and is well known throughout the industry for his untiring efforts in promoting the use of convenient time payment terms in the sale of heating and plumbing products.

R. V. LeSUEUR

Richard Vryling LeSueur, 64, prominent Canadian civic leader and president and chairman of the board of Imperial Oil Limited, Canadian affiliate of Standard Oil Company (N. J.), died September 6 after a brief illness.

Long active in Canadian civic affairs, Mr. LeSueur was vice-chairman of the War Finance Committee of Ontario, the organization corresponding to the American war bond drives, and numerous other cultural and charitable organizations.

Long recognized as an authority on oil exploration work, Mr. LeSueur played a prominent role in the development of Turner Valley and Norman Wells in Northwest Canada and as an official of International Petroleum he intensified similar work in Venezuela, Colombia, Ecuador and Peru.

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1—Roots Exhauster size No. 7 with Troy Engine VI serial 11609 Steam Cylinder 7 x 8.

1—Connersville Meter 12 x 36 Low Pressure No. 7917.

1—Roots Rotary Blower No. 36326 Size No. 7 Connected to Troy Engine.

5—Steam Pumps Reciprocating — Assorted Sizes and Makes.

2—Ingersoll Rand Imperial Type 10 X.P.V. Air 18 x 14—Steam 11 x 18 x 14.

3—Brownell 150 H.P. Boilers.

1—Sorge Cochrane Hot Process Water Softener with Motor and Pumps — Capacity 1440 gallons per hour.

2—Steel Purifier Boxes—12 feet high x 8 feet diameter.

1—Scrubber 20 feet high x 5'6" diameter with 10 inch connections.

1—Scrubber 24 feet high x 8 feet diameter with 16 inch connections.

1—Condenser 20 feet high x 5'6" diameter with 10 inch connections.

1—Condenser 21 feet high x 8 feet diameter with 16 inch connections.

For more detailed information write

Central Indiana Gas Co.,

311 South Boots, Marion, Indiana.

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PUBLIC UTILITIES
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Wanted—Industrial Engineer

Eastern gas utility with 39,000 meters needs experienced industrial and commercial engineer. Prefer man under 40 years of age. Start at once. Address Box 145, c/o AMERICAN GAS JOURNAL, Inc., 53 Park Place, New York 7, N. Y.

Burners and Melting Furnaces: Catalog 1039 of Hauck Manufacturing Co., Brooklyn 15, N. Y., includes heating and melting equipment for public utilities and pipe line contractors. Melting kettles for tars and bituminous compounds, lead melting pots and ground thawing equipment are among the items described.

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For All Gas Appliances

S-80

2-21

We have the facilities and experience for designing and building the exact type and size of burner unit to fit any gas appliance, using natural, manufactured, Butane or bottled gas. We cooperate with any reliable manufacturer in the necessary development and laboratory testing, and in acting as continuous source of supply for his burner units.

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The mark of
unerring dependability
in purification
GAS PURIFYING MATERIALS CO., INC.
3-15 26th Ave.
Long Island City 2, New York

Hydrocarbon Gases

(Continued from page 30)

necessary to cool the top of the fire with the shorter blow run. The same steam rate is used with butane as with oil gas, except for the steam purges, which is reflected in the longer first steam purge. The increase in blow in Column 3 seems more than necessary for the decrease in blow run, but is necessitated by the higher atmospheric temperature which requires a longer blow to get the same weight of air through the fire to do the necessary heating.

Table III compares the composition of reformed oil gas, carburetted water gas and coke oven gas. The components are classified as "Fast Burning," "Slow Burning" and "Non-Combustible" gases. Columns 1 to 7 are analyses of reformed oil gas taken during various stages in the development of the process.

Columns 1 and 2 cover the experimental tests at Station A of Philadelphia Gas Works Company, and Columns 3 and 4 show the very early operation at Tilghman Street Plant, Chester. The compositions of these gases are very similar to Coke Oven Gas, and contain a high percentage of CO and H_2. Columns 5 and 6 reflect the first introduction of a small amount of blow run into our cycle, with a decrease in the "blue gases" and a corresponding increase in the hydrocarbons and non-combustibles. Column 7 shows our reformed oil gas as now produced with a considerable amount of blow run and a greatly reduced percentage of "blue gases," so that the gas consists of nearly equal parts of "Fast Burning," "Slow Burning" and "Non-Combustible" gases. The composition of this gas which has been developed over a number of years is, we feel, responsible for the success we have had in interchanging it with coke over gas of the same heating value but much lower specific gravity. The manner in which the composition aids this interchangeability is discussed a little later in this paper.

Presented at the Gas Company Managers Conference of New England Gas Association, Boston June 29th. The other part of Mr. Boyer's paper was published in the August issue of the JOURNAL.

Industrial and Commercial Gas Section Program at A.G.A. Annual Meeting

In connection with the Annual Meeting of the American Gas Association to be held October 24 and 25, 1945, at the Engineering Societies Building, 29 West 39th Street, New York City, the Industrial and Commercial Gas Section will hold the following final meetings of several of its committees at the Hotel Pennsylvania, New York City.

October 24th—Afternoon

Food Service Equipment Committee,
Roy E. Wright, Chairman, New England Gas and Electric System.

Committee on Heat Treating with Gas,
Carl H. Lekberg, Chairman, Northern Indiana Public Service Company.

National Advertising Committee of the Industrial and Commercial Gas Section,
J. P. Leinroth, Chairman, Public Service Electric and Gas Company.

October 25th—Afternoon

Managing Committee of the Industrial and Commercial Gas Section,
Harry K. Wrench, Chairman, Minneapolis Gas Light Company.
Harry A. Sutton, Vice Chairman, Public Service Electric and Gas Company.

Members of the new Managing Committee have been invited to attend in order that this committee may start functioning by planning the activities it will supervise for the coming Association year.

Dresser Industries Appoints Roy A. Bass to New Post

Roy A. Bass has recently been appointed Director of Distribution of Dresser Industries, Inc., Cleveland, Ohio, a new post.

In this position he will be responsible for the national program of Dresser and its member companies in the establishment and expansion of distribution in industrial centers.

An engineering graduate of Cornell, Bass has been active in both sales and marketing for a number of years. Before assuming his present duties, he was Buffalo District Sales Manager for Ross Heater & Mfg. Co., Inc., Buffalo, N. Y., with whom he has been connected for the past 11 years.

Cumberland & Allegheny Gas Names Home Service Director

Miss Alice Ruth Hoon has been appointed Home Service Director of the Cumberland & Allegheny Gas Company.

In announcing this appointment, C. C. Robbins, District Manager, revealed that Miss Hoon is now directing home service activities from the Home Service Headquarters in the natural gas company's recently opened new Cumberland office.

Miss Hoon is a native of New Concord, O., and received her degree in home economics from Muskingum College in that community. In recent years she has been on the faculty of Ohio high schools in Litchfield, Shreve and New Concord, as a home economics instructor. In that capacity she has acquired specialized training in school cafeterias and school lunch operations.

Servel Employees Receive Service Certificates

The management of Servel, Inc., Evansville, Indiana, has mailed certificates of loyal and faithful service to all war-time employees of the company.

During the war period Servel was engaged in the manufacture of wings for the P-47 Thunderbolt and other diversified war products.

The certificates were signed by Mr. Ruthenburg and also by the vice-president, superintendent, and foreman of the division in which each worker was employed.

New Valve Lubricant Manual

Featuring the uses of lubricants in lubricated plug valves, Merco Nordstrom Valve Company has just released a new and completely reedited manual.

It gives complete instructions in application of valve lubricants and lists 40 types in stick and bulk form including a silicone type. More than 100 specific valve services are included, with corresponding lubricant recommendations, for various conditions of line fluid, temperature and pressure.

A copy may be obtained by any user of Nordstrom Valves. The manual is No. V-105, Rev. 6. Address Merco Nordstrom Valve Company, 400 Lexington Avenue, Pittsburgh 8, Pa.

Catalogs

Gas Holders and Storage Tanks. A comprehensive picture story of the fabrication and erection of gas holders, storage tanks, processing vessels, and other structures is contained in General Bulletin G-45 of the Stacey Bros. Gas Construction Company, Cincinnati—one of the Dresser Industries.

Available on request, the 44-page bulletin shows the company's production and erection facilities in action, and illustrates in detail many of the products such as gas holders, storage tanks, and processing equipment which Stacey Bros. builds for the gas, petroleum, chemical and food industries.

Compressors. Ingersoll-Rand Co., 11 Broadway, New York 4, Bulletin No. 3081, describes in much detail their KVG Compressors—5 models ranging from 600 to 1,000 H.P. These machines add to the line of 4-cycle V-angle type gas-engine-driven compressors which the company created and introduced to the oil industry in 1932. They marked the break with the customary horizontal models of that day.

The KVG, a natural addition to earlier and smaller units, was brought out to fulfill the demand for larger compressors of this type for refining and services such as repressuring, recycling and gas distribution. More than 500,000 hp of these V-angle units have been installed for that work and in other industries having natural or manufactured gas as fuel. Some of these are synthetic rubber, aviation gasoline, chemical and process plants.

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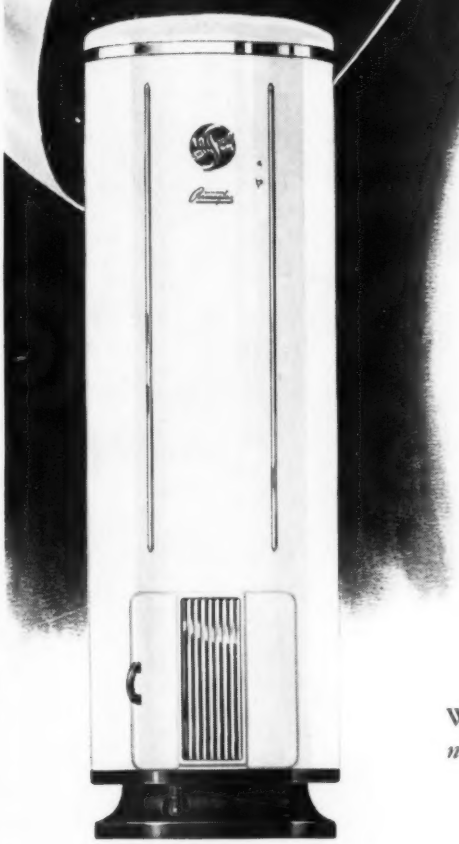

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A Message to our Customers

PRODUCTION! With VJ-Day culminating the War, the Sprague Meter Company, like all other suppliers of the Gas Industry, look forward to the day when restrictions will be a thing of the past and we can move forward to unprecedented production.

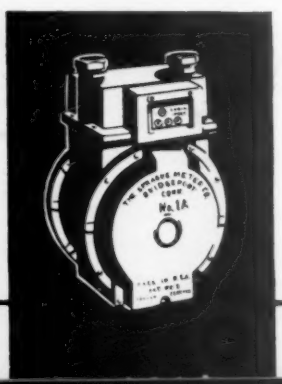
SERVICE! Sprague has been noted for its service, and in spite of tremendous demands placed upon the Company during the War, we continued to give the same high quality of service as promptly as could be effected under prevailing conditions.

NO SUBSTITUTES! During the War no substitute materials were used in any part of the meter. This means that standard parts have been used throughout the War and will continue to be used in Spragues.

APPRECIATION! Your cooperation and patience has been greatly appreciated. We have done the best we possibly could, and it will be a pleasure to continue to serve you to the fullest extent of our ability.

H. L. Fairchild.

President and General Manager



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